E-SERIES
WHAT'S NEW

- NEW POWERTRAIN FEATURES – 7.3L V8 engine replaces: – 6.8L V10 and 6.2L V8
- Two unique 7.3L engine calibrations for E-Series only
- Gaseous Fuel Prep Package – OPTIONAL
- New electrical system architecture with all-new control modules
- Upfitter Interface Module (UIM) – OPTIONAL
- New standard 210 amp alternator replaces the 150/155 amp alternator
- Freshened interior and new Instrument panel
- Updated fuel fill pipe and evaporative canister package information
- New Smart Driver-Assist Technology Package – OPTIONAL
- ADAS- Driver Assist System "Field of View Zones"
- Updated SEIC/ BCP Circuits and Schematics
- Selectable engine ramp rate for SEIC

E-SERIES INDEX

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WARNING:
During the product˙on and servicing of these vehicles, due care should be taken to avoid damaging of safety or emissions related systems such as the braking system, fuel lines, sensors, catalysts, etc. through contacting them while working on adjacent areas of the vehicle. Inadvertent damage can also occur due to adjacent welding/cutting operations, people standing near/on unprotected systems while performing other tasks.

Introduction

Important Notices

The information described herein is believed to be correct at the time of publication, but accuracy cannot be guaranteed. Ford reserves the right to discontinue models or change specifications or designs at any time without notice and without incurring any obligation.

Representations regarding the compliance of any Ford-manufactured incomplete vehicle to any rule, regulation or standard issued pursuant to the National Traffic and Motor Vehicle Safety Act or the Canadian Motor Vehicle Safety Act are set forth only in the Incomplete Vehicle Manual (IVM) which accompanies each incomplete vehicle.

Regulations such as those issued by the Federal Highway Administration (FHA) or issued pursuant to the Occupational Safety and Health Act (OSHA), and/or state, provincial, and local laws and regulations may require installation of additional equipment for the particular use intended for the vehicle. It is the responsibility of the subsequent stage manufacturer or completed vehicle alterer and the vehicle purchaser to ascertain how the vehicle will ultimately be used, if FHA, OSHA or state provincial or local regulations apply and how the vehicle as completed will comply with those requirements. Nothing contained herein is to be construed as a representation that such equipment required for the particular use intended has been installed on the completed or incomplete vehicle.

Reference Information

Ford Body Builder Advisory Service Publications

This document is an example of a program-specific Body Builders Layout Book (BBLB) published by the Ford Body Builder Advisory Service (BBAS) team. Each Ford Commercial Truck vehicle line has a similar document that aims to provide detailed information which may be of interest to a subsequent-stage manufacturer or alterer.

The Ford Transit and Transit Connect also have a Body and Equipment Mounting Manual (BEMM), which is a comprehensive resource dedicated to body and equipment mounting information.

Yet another source of program-specific information are the "Vehicle Specification" documents available on the Ford BBAS website. Information typically found in these documents are: vehicle curb and accessory weights, vehicle dimensions, component descriptions, capacities, GAWRs, alternator output, powertrain output and gear ratios.

In addition to the program-specific documents, there are several Ford BBLB documents that contain general best practices or information on specific subjects that span multiple vehicle lines. These include:

- General BBLB - contains Definitions, Design Recommendations and Vehicle Storage Guidelines.
- Snow Plow BBLB
- Pickup Box Removal BBLB

These publications are updated every model year and can be accessed via the web at https://fordbbas.com under "Publications". For BBLB and BEMM documents, expand the "Body Builder Layout Book" Section to view all available documents. For Vehicle Specifications, expand the "Vehicle Specifications" section. The website search function can be used to filter for specific content or vehicle line.

Ford Body Builder Advisory Service Bulletins

Occasionally, the Ford BBAS team will create an SVE "Bulletin" to address a specific issue or distribute important information in a timely manner. These documents can be accessed via the web at https://fordbbas.com under "Bulletins". The website search function can be used to filter for specific content or vehicle line.

If applicable, information from each SVE bulletin will be incorporated into the appropriate BBLB document the following model year. In some cases, SVE bulletins will continue to be referenced in this document.

Ford Body Builder Advisory Service Contact

The Ford Truck Body Builder Advisory Service may be consulted if questions regarding the completion of Ford commercial vehicles are not adequately addressed in the documentation described above. For assistance call (877) 840-4338 or e-mail via the web at https://fordbbas.com under "Contact Us" and select "General Questions".

For Ford vehicle CAD requests, please visit https://fordbbas.com, select "Contact Us" and then "CAD Request".

For both Questions and CAD Requests, please be as specific as possible with the request details to assure the most accurate and timely response.

Ford Service Publications

Ford Service Technical Resources (including wiring diagrams, repair manuals and diagnostic tool support) are available by subscription via the Motorcraft website: www.motorcraftservice.com

The following publications are examples of digital and printed manuals which are available from Helm Incorporated; call 1-800-782-4356 or contact Helm, Inc. at their website www.helminc.com:

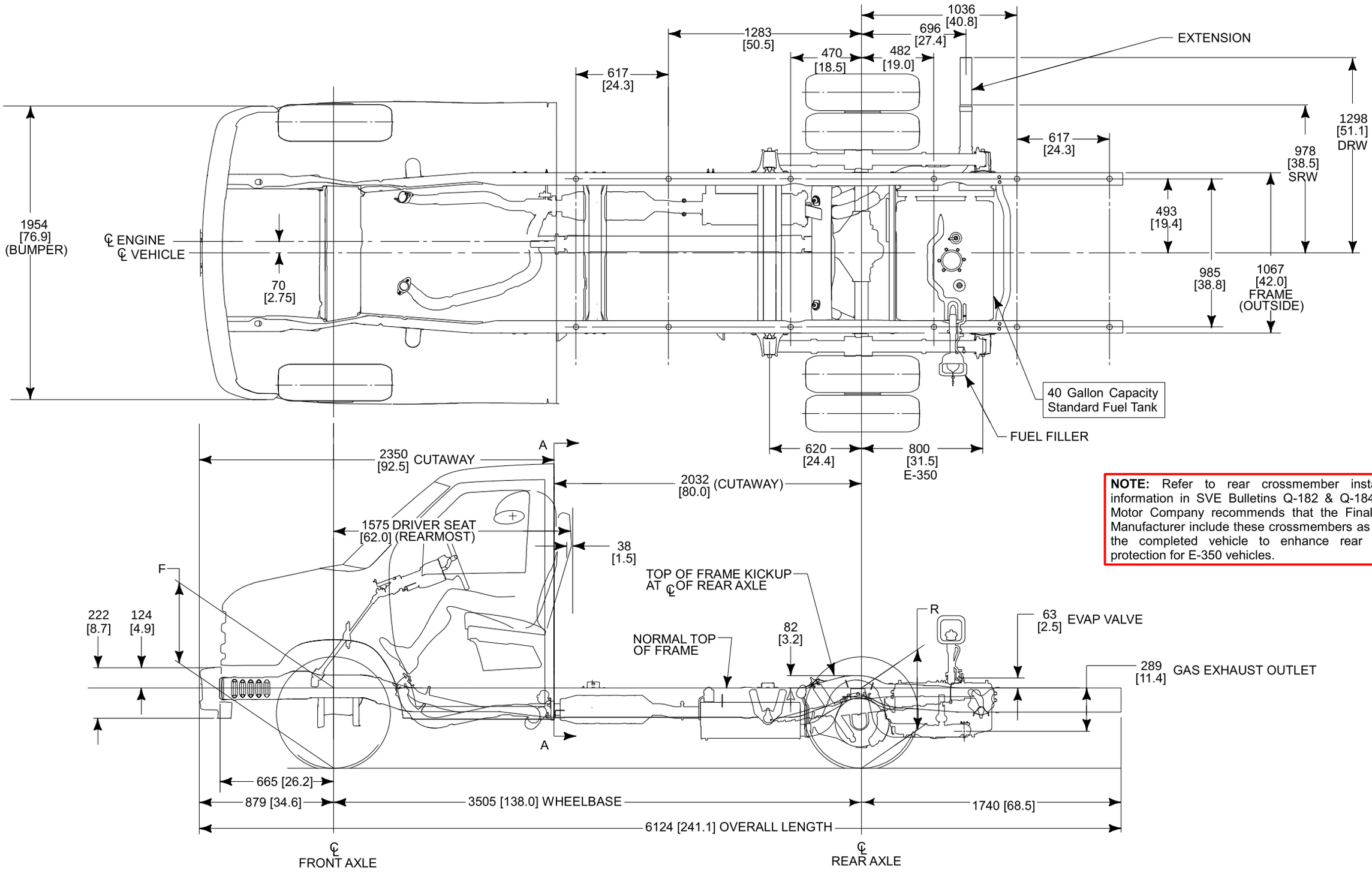
- Ford Truck Shop Manuals
- Ford Towing Manuals
- Ford Wiring Diagrams

E-SERIES
MODEL LINEUP

Model	WB (in.)	Engine	Trans	Maximum GVWR (lbs.)	Max Payload (lbs.)	Spring/GAWR (lbs.)(1)		Base Curb Weight (lbs.)		
						Front Range Min.-Max.	Rear	Front	Rear	Total
E-350 Cutaway	138 SRW	7.3L Premium	6R140	10050	5100	4200	6084	2958	1992	4950
		7.3L Economy	6R140	10050	5100	4050-4200	6084	2958	1992	4950
	138 DRW	7.3L Premium	6R140	11500	6270	4050-4600	7800	3001	2224	5225
		7.3L Economy	6R140	11500	6270	4050-4600	7800	3001	2224	5225
	158 SRW	7.3L Premium	6R140	10050	5030	4200	6084	3039	1973	5012
		7.3L Economy	6R140	10050	5030	4200	6084	3039	1973	5012
E-350 Cutaway	158 DRW	7.3L Premium	6R140	11500	6210	4200-4600	7800	3082	2205	5287
		7.3L Premium	6R140	12500	7210	4200-5000	8500	3082	2205	5287
		7.3L Economy	6R140	11500	6210	4050-4600	7800	3082	2205	5287
		7.3L Economy	6R140	12500	7210	4050-5000	8500	3082	2205	5287
	176 DRW	7.3L Premium	6R140	12500	7200	4200-5000	8500	3148	2149	5297
		7.3L Economy	6R140	12500	7200	4200-5000	8500	3148	2149	5297
E-350 Stripped	138 DRW	7.3L Premium	6R140	11500	6870	4400-4600	7800	2421	2204	4625
		7.3L Economy	6R140	11500	6970	4200-4600	7800	2421	2204	4625
	158 DRW	7.3L Premium	6R140	12500	7820	4600-5000	8500	2480	2198	4678
		7.3L Economy	6R140	12500	7820	4600-5000	8500	2480	2198	4678
	176 DRW	7.3L Premium	6R140	12500	7760	4600-5000	8500	2535	2197	4732
		7.3L Economy	6R140	12500	7760	4600-5000	8500	2535	2197	4732
E-450 Cutaway	158 DRW	7.3L Premium	6R140	14500	8980	5000	9600	3078	2434	5512
		7.3L Premium	6R140	14200	8680	4600	9600	3078	2434	5512
		7.3L Economy	6R140	14000	8480	4400-5000	9600	3078	2434	5512
	176 DRW	7.3L Premium	6R140	14500	8980	5000	9600	3161	2358	5519
		7.3L Premium	6R140	14200	8680	4600	9600	3161	2358	5519
		7.3L Economy	6R140	14000	8480	4400-5000	9600	3161	2358	5519
E-450 Stripped	158 DRW	7.3L Premium	6R140	14500	9690	5000	9600	2531	2274	4805
		7.3L Economy	6R140	14000	9190	4600-5000	9600	2531	2274	4805
	176 DRW	7.3L Premium	6R140	14500	9640	5000	9600	2566	2292	4858
		7.3L Economy	6R140	14000	9140	4600-5000	9600	2566	2292	4858

(1) Gross Axle Weight Rating is determined by the rated capacity of the minimum component of the axle system (axle, wheels, tires) of a specific vehicle. Front and rear GAWRs will, in all cases, sum to a number equal to or greater than the GVWR for the particular vehicle. Maximum loaded vehicle (including passengers, equipment and payload) cannot exceed the GVWR or GAWR (front or rear).

E-SERIES
DIMENSIONAL DATA
E-350 SUPER DUTY CUTAWAY 138” WB (SRW / DRW)

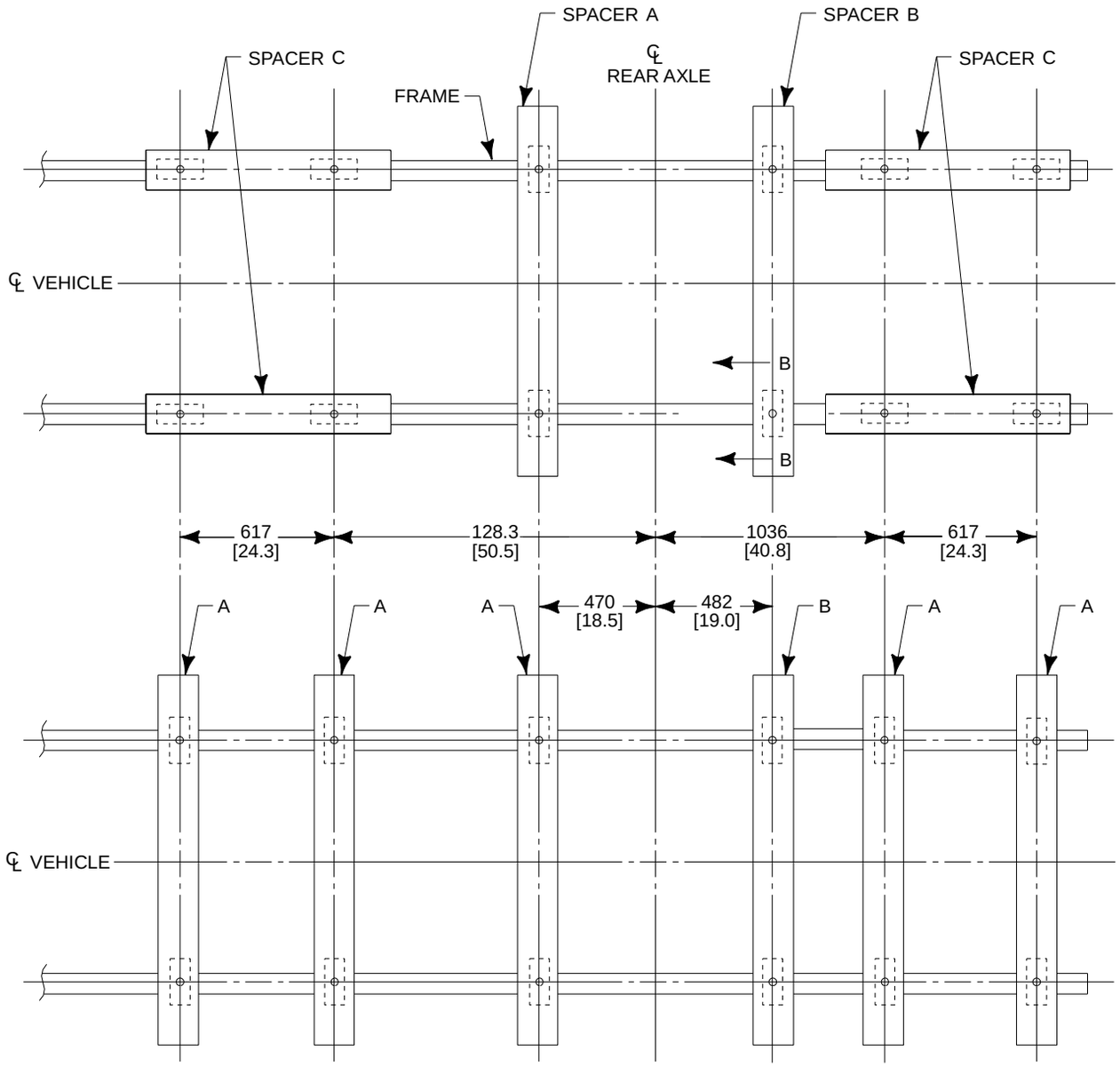


NOTE: Refer to rear crossmember installation information in SVE Bulletins Q-182 & Q-184. Ford Motor Company recommends that the Final stage Manufacturer include these crossmembers as part of the completed vehicle to enhance rear impact protection for E-350 vehicles.

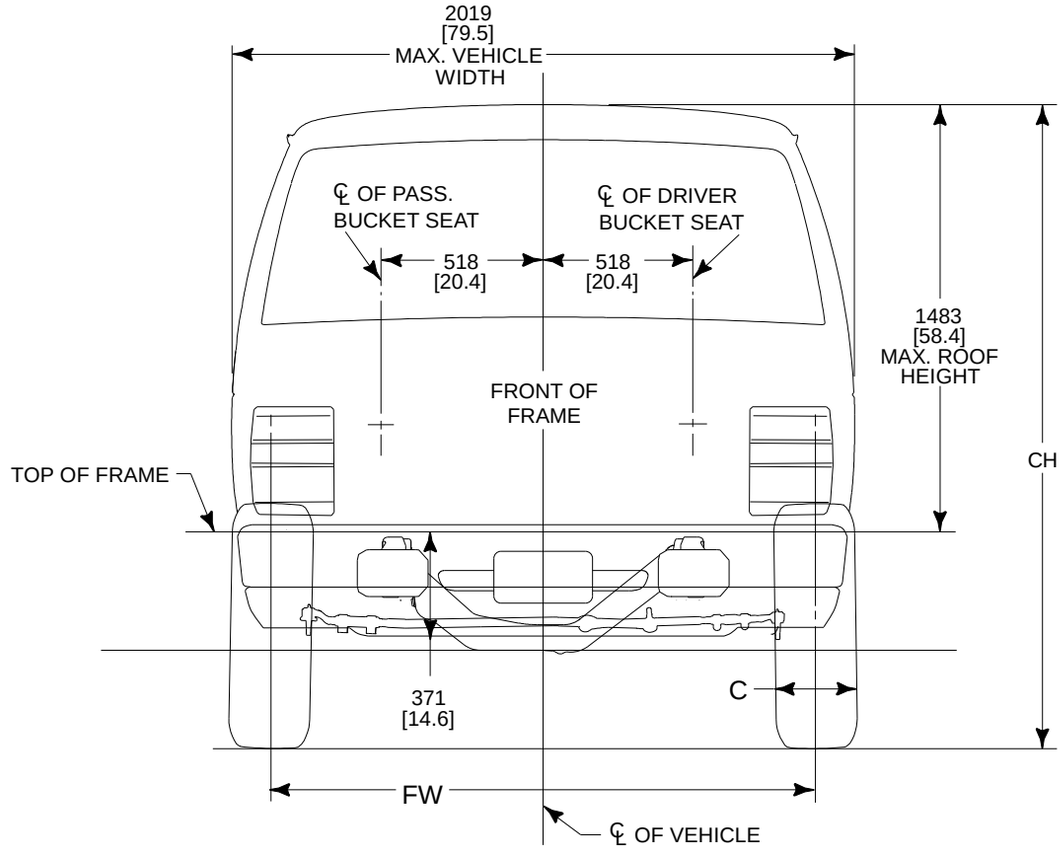
NOTE — [ ] DIMENSIONS ARE INCHES.

(Cont'd next page)

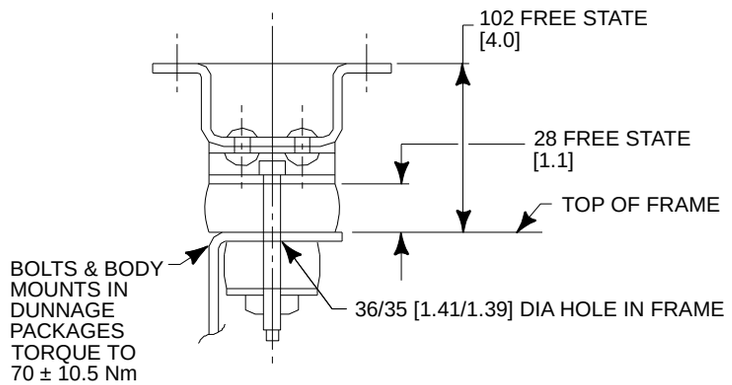
E-SERIES
DIMENSIONAL DATA
E-350 SUPER DUTY CUTAWAY 138” WB (SRW / DRW) (Cont'd)



INCLUDES 6 LATERAL FRAME SPACERS WITH 12 BODY MOUNTS. USES SAME FRAME HOLES FOR LONGITUDINAL/LATERAL FRAME SPACER STANDARD SYSTEM.



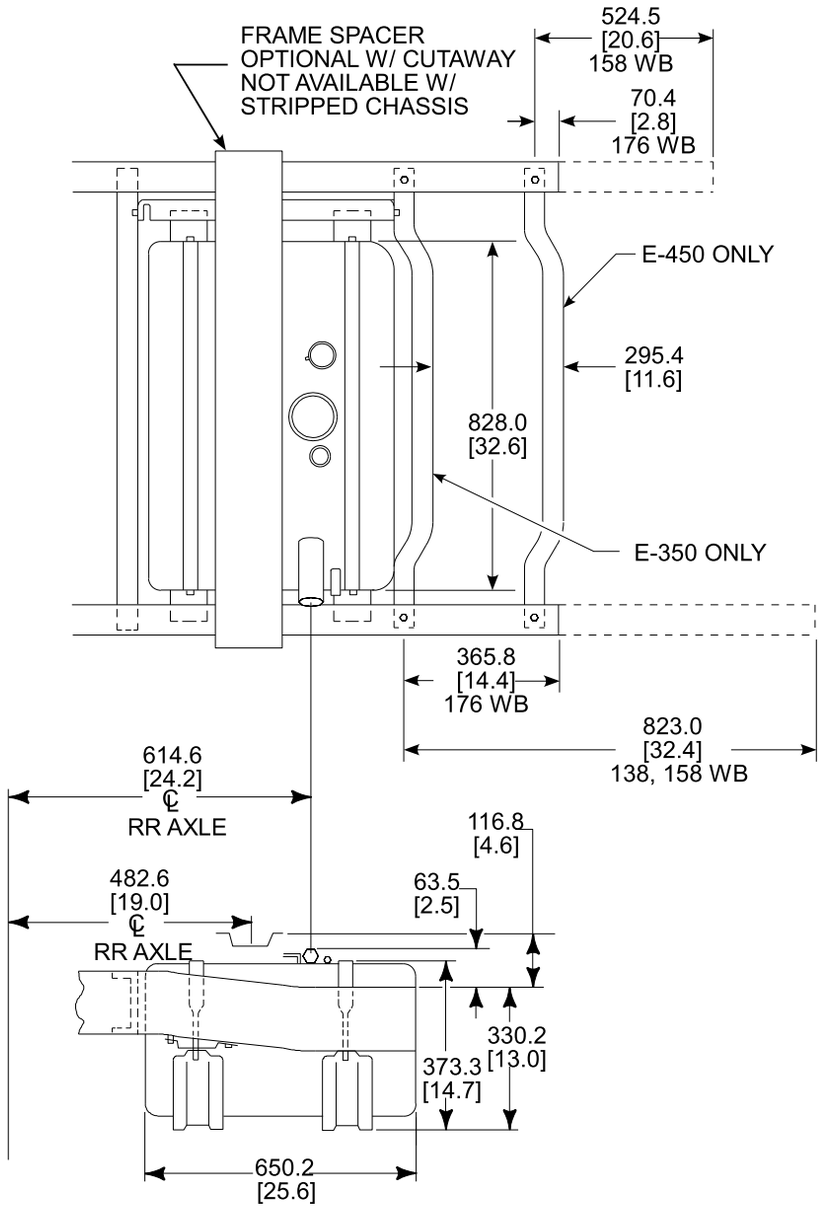
FRONT VIEW


102 FREE STATE [4.0]
28 FREE STATE [1.1]
TOP OF FRAME
BOLTS & BODY MOUNTS IN DUNNAGE PACKAGES TORQUE TO 70 ± 10.5 Nm
36/35 [1.41/1.39] DIA HOLE IN FRAME

SEC B

NOTE — [ ] DIMENSIONS ARE INCHES.

E-SERIES
DIMENSIONAL DATA
E-350 SUPER DUTY CUTAWAY 138” WB (SRW / DRW)

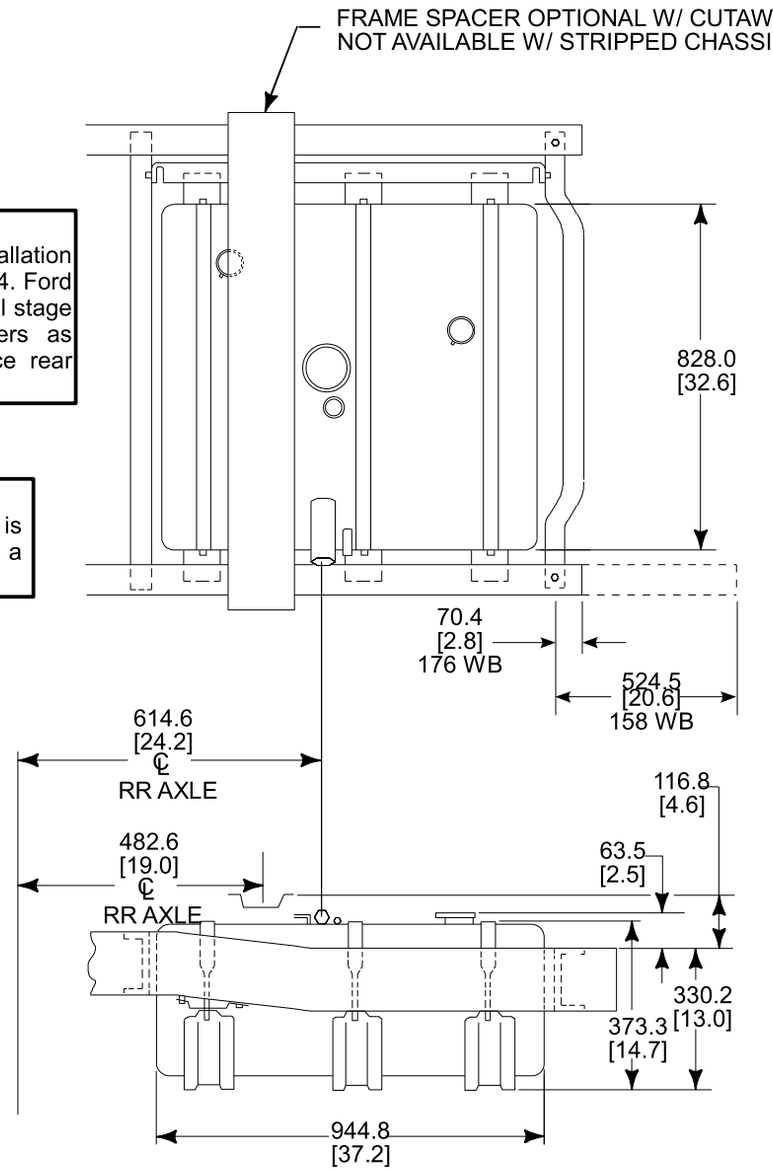


40 GALLON TANK

E-350: 138”, 158”, 176” WB
E-450: 158”,176” WB

NOTE:
Refer to rear crossmember installation information in SVE Bulletins Q-182 & Q-184. Ford Motor Company recommends that the Final stage Manufacturer include these crossmembers as part of the completed vehicle to enhance rear impact protection for E-350 vehicles.

WARNING:
An 18” minimum frame extension is required on the 176” WB frame with a 55 gallon fuel tank.

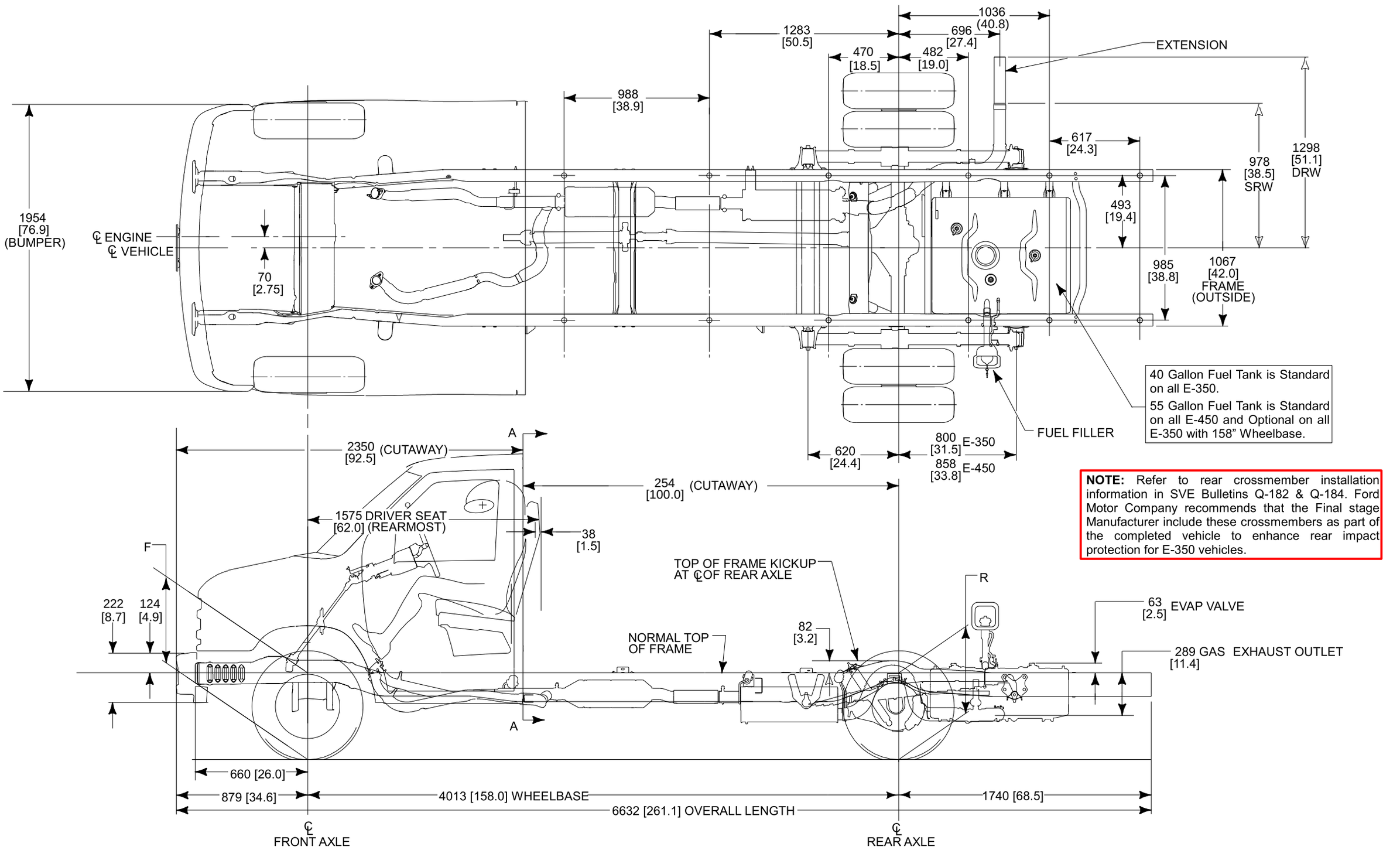


55 GALLON TANK

E-350: 158” WB
E-450: 158”, 176” WB

NOTE — [ ] DIMENSIONS ARE INCHES.

E-SERIES
DIMENSIONAL DATA
E-350/450 SUPER DUTY CUTAWAY 158” WB (SRW / DRW)

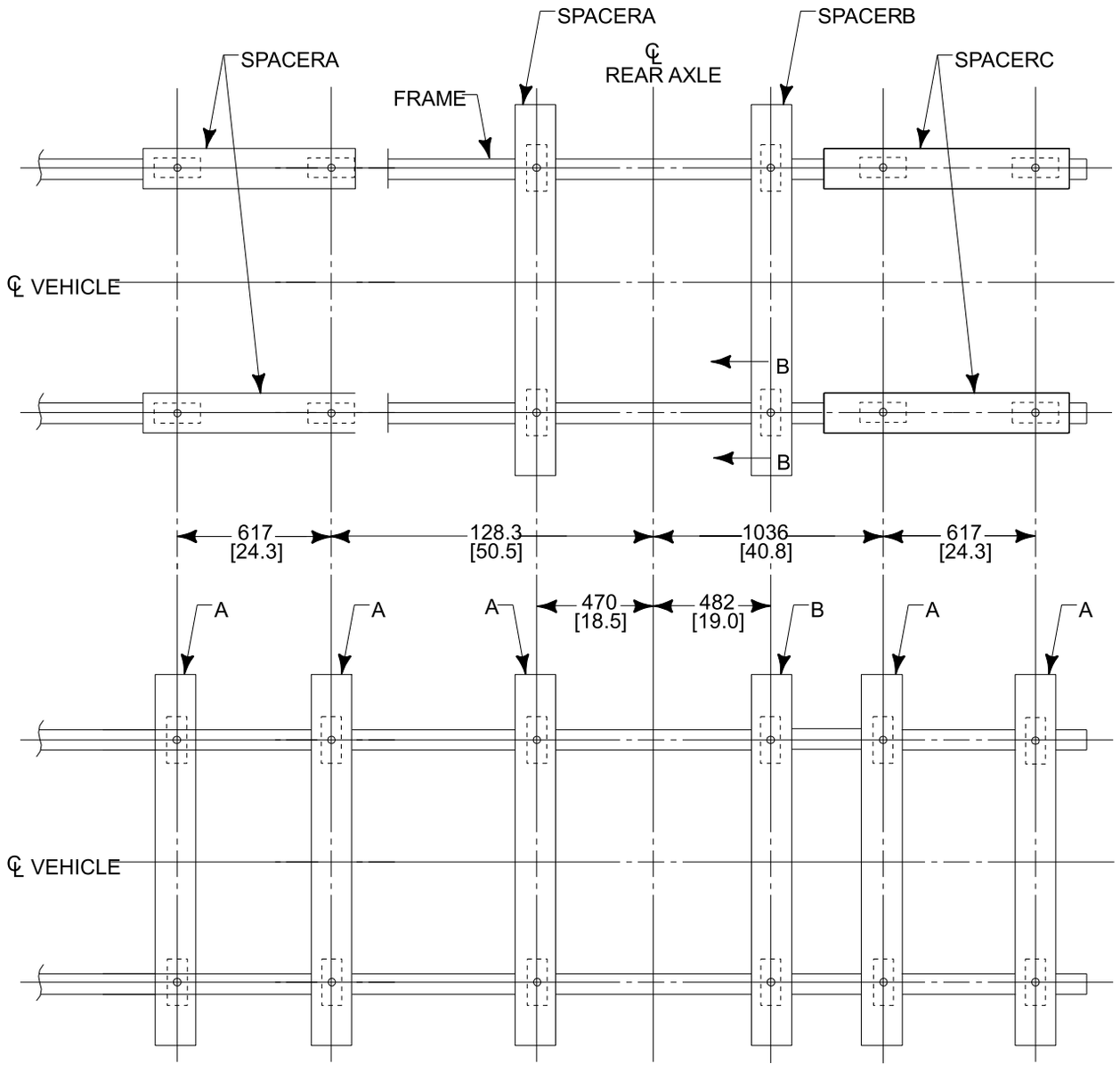


NOTE: Refer to rear crossmember installation information in SVE Bulletins Q-182 & Q-184. Ford Motor Company recommends that the Final stage Manufacturer include these crossmembers as part of the completed vehicle to enhance rear impact protection for E-350 vehicles.

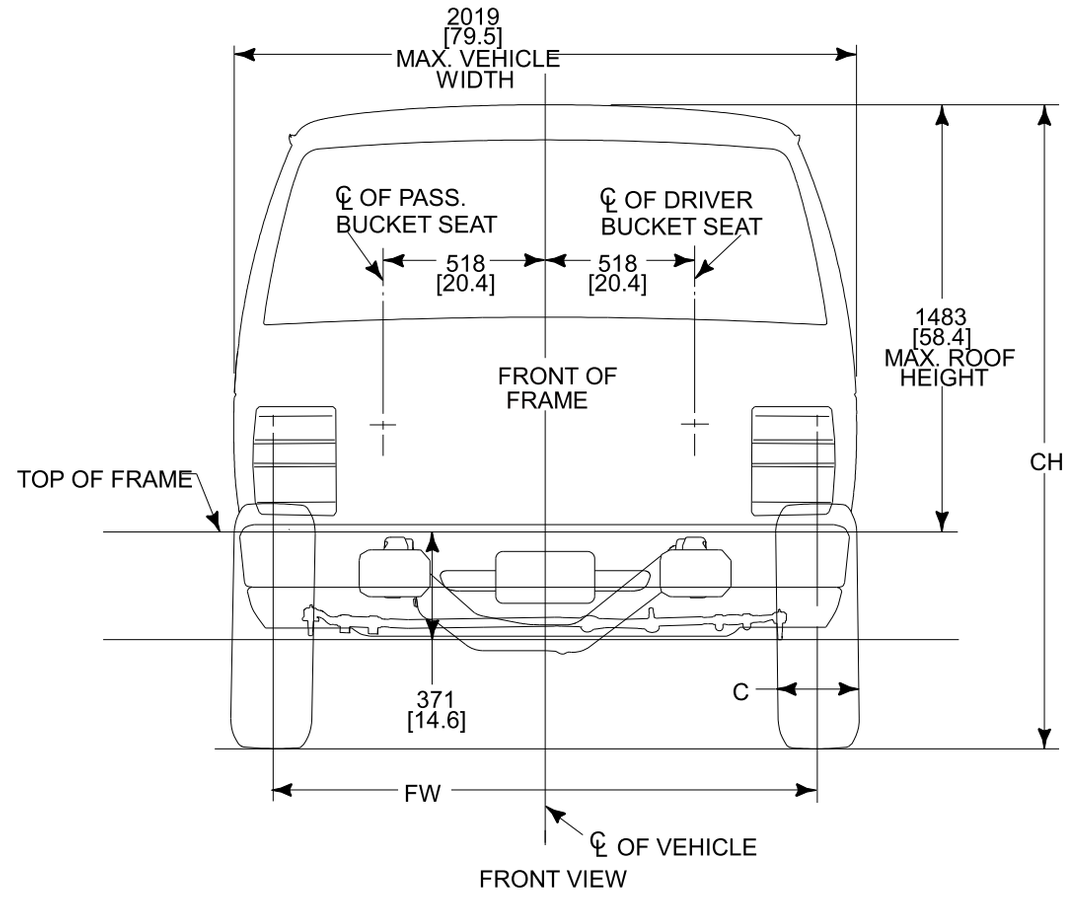
NOTES — [ ] DIMENSIONS ARE INCHES.
— FOR CA DIMENSION, SEE MODEL LINE UP.

(Cont'd next page)

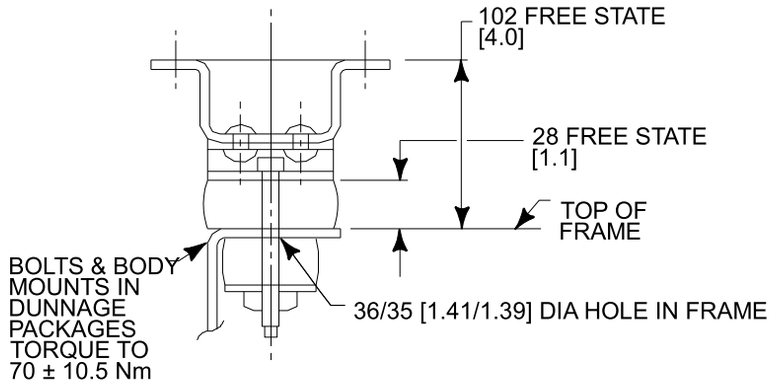
E-SERIES
DIMENSIONAL DATA
E-350/450 SUPER DUTY CUTAWAY 158” WB (DRW) (Cont'd)



INCLUDES 6 LATERAL FRAME SPACERS WITH 12 BODY MOUNTS. USES SAME FRAME HOLES FOR LONGITUDINAL/LATERAL FRAME SPACER STANDARD SYSTEM.



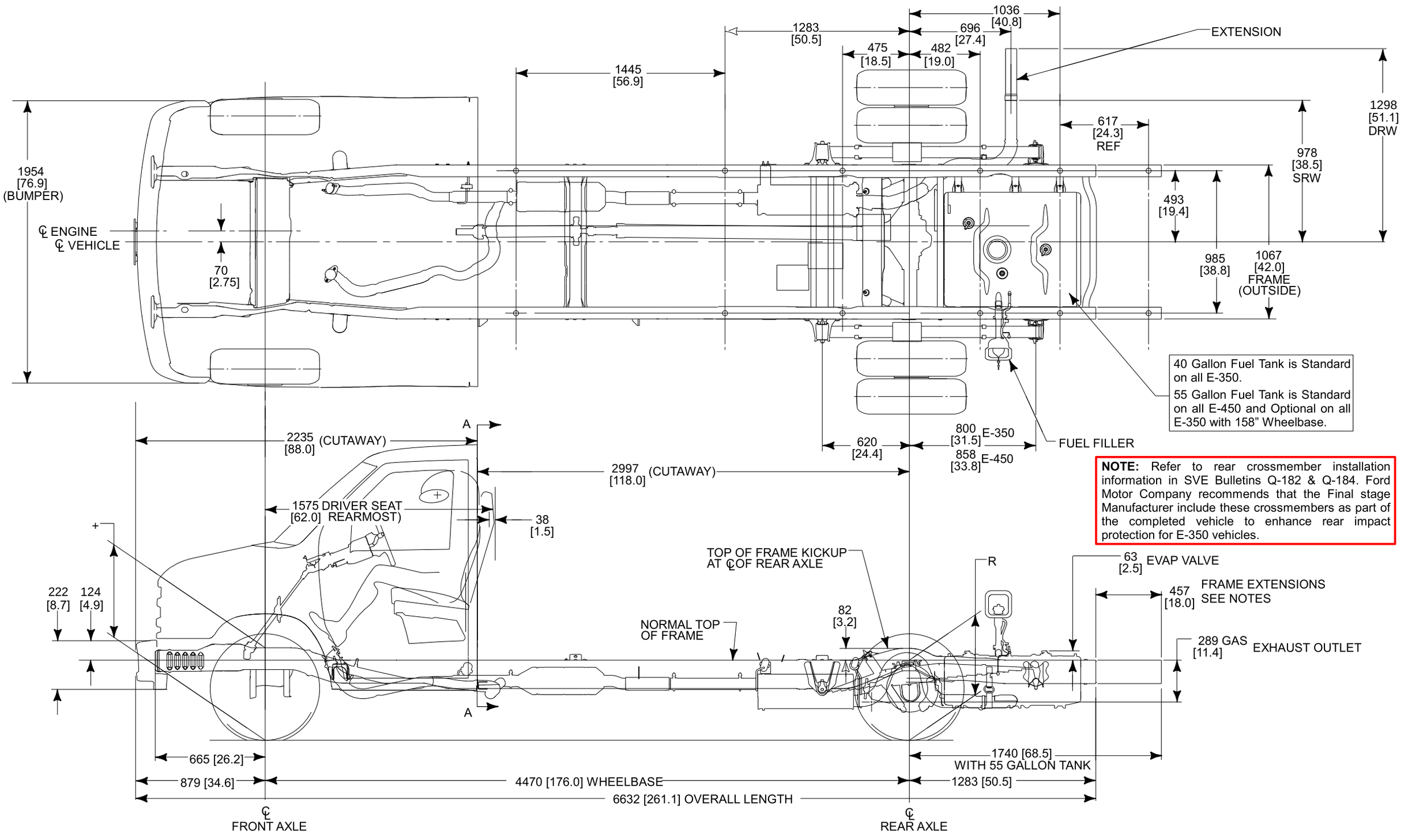
FRONT VIEW


102 FREE STATE [4.0]
28 FREE STATE [1.1]
TOP OF FRAME
BOLTS & BODY MOUNTS IN DUNNAGE PACKAGES TORQUE TO 70 ± 10.5 Nm
36/35 [1.41/1.39] DIA HOLE IN FRAME

SEC B

NOTE — [ ] DIMENSIONS ARE INCHES.

E-SERIES
DIMENSIONAL DATA
E-350/450 SUPER DUTY CUTAWAY 176” WB (DRW)

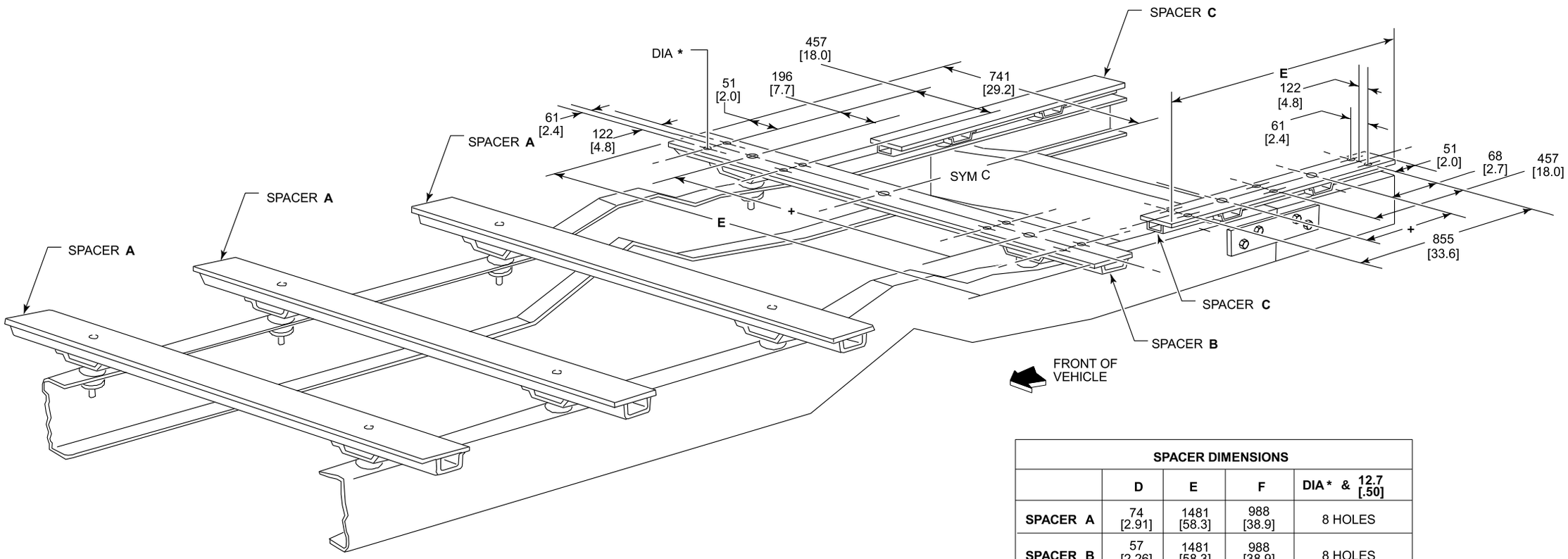


NOTE: Refer to rear crossmember installation information in SVE Bulletins Q-182 & Q-184. Ford Motor Company recommends that the Final stage Manufacturer include these crossmembers as part of the completed vehicle to enhance rear impact protection for E-350 vehicles.

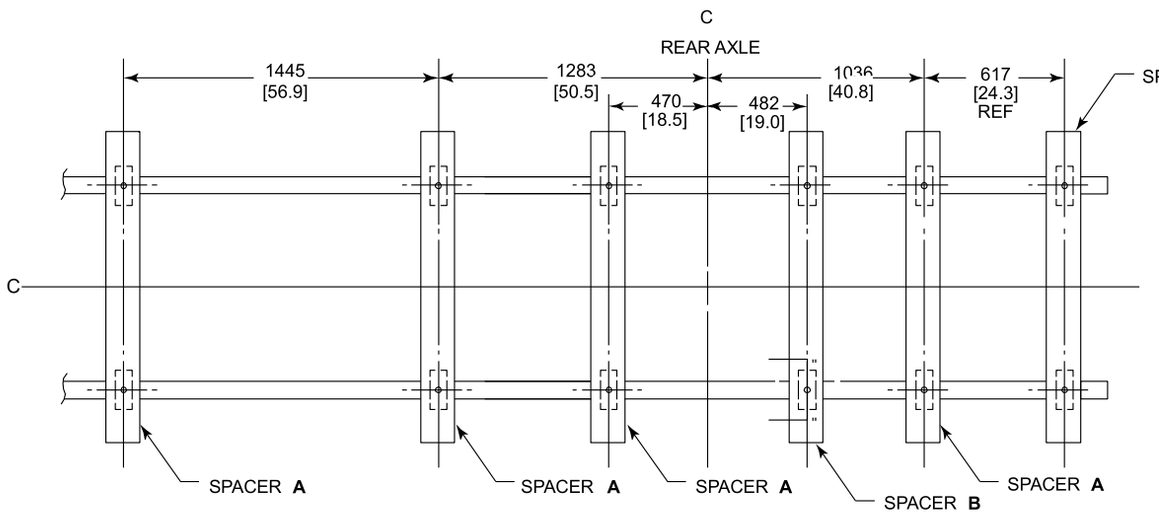
NOTES — [ ] DIMENSIONS ARE INCHES.
— FOR CA DIMENSION, SEE MODEL LINEUP.

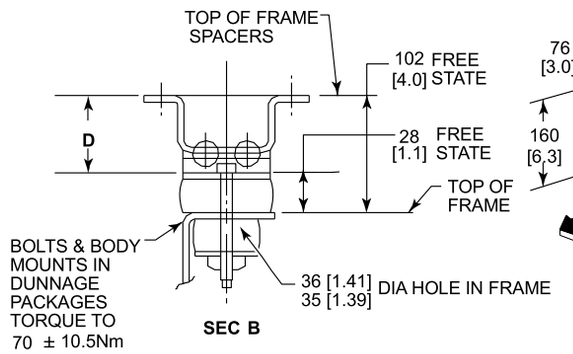
(Cont'd next page)

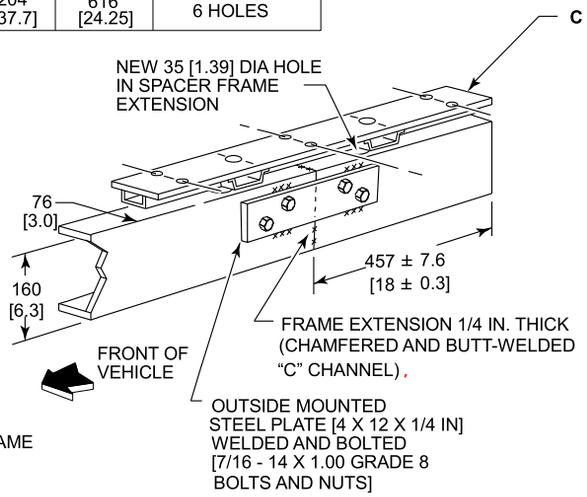
E-SERIES
DIMENSIONAL DATA
E-350/450 SUPER DUTY CUTAWAY 176” WB (DRW) (Cont'd)



SPACER DIMENSIONS				
	D	E	F	DIA * & 12.7 [.50]
SPACER A	74 [2.91]	1481 [58.3]	988 [38.9]	8 HOLES
SPACER B	57 [2.26]	1481 [58.3]	988 [38.9]	8 HOLES
SPACER C	74 [2.91]	204 [37.7]	616 [24.25]	6 HOLES

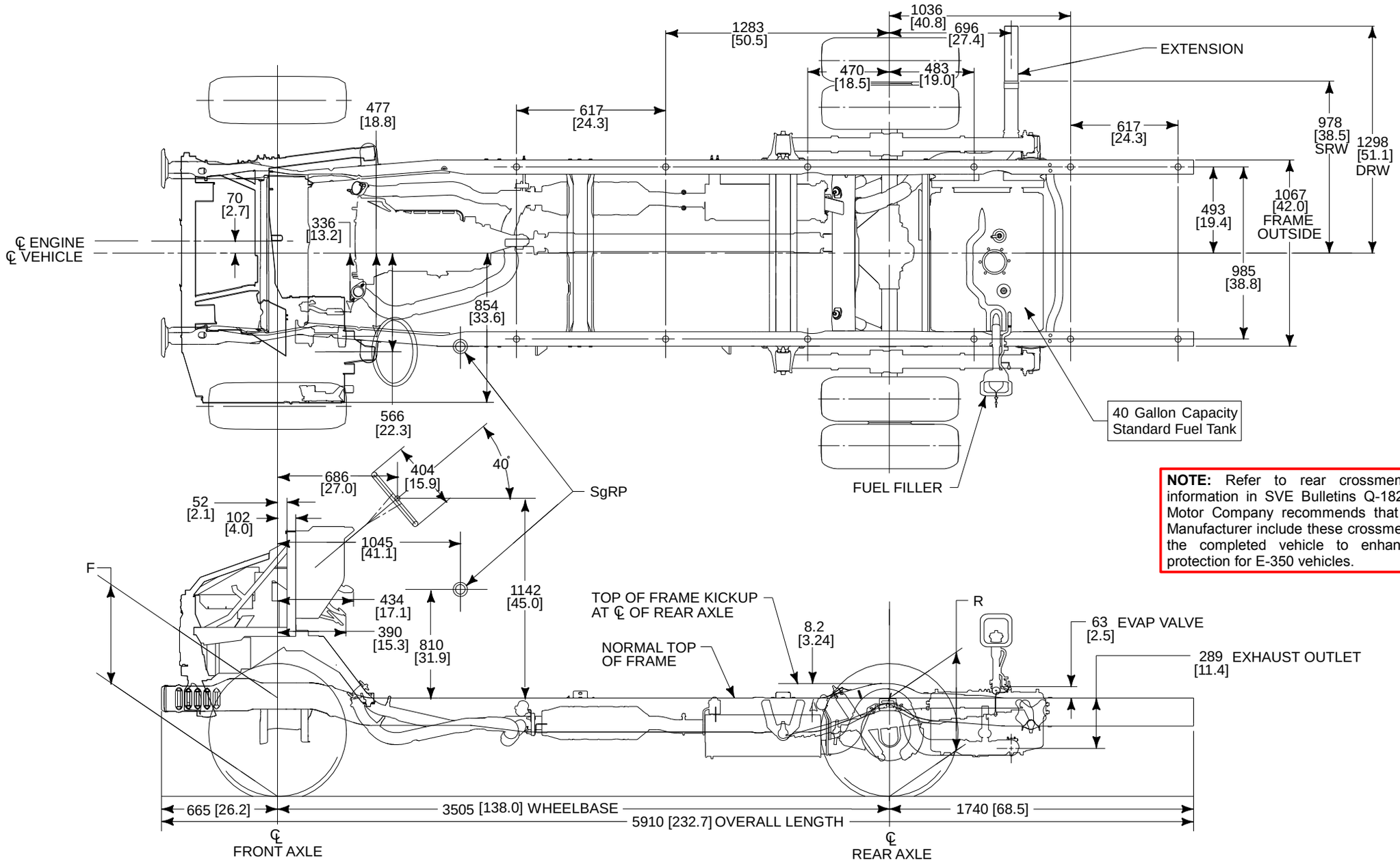






NOTE — [ ] DIMENSIONS ARE INCHES.

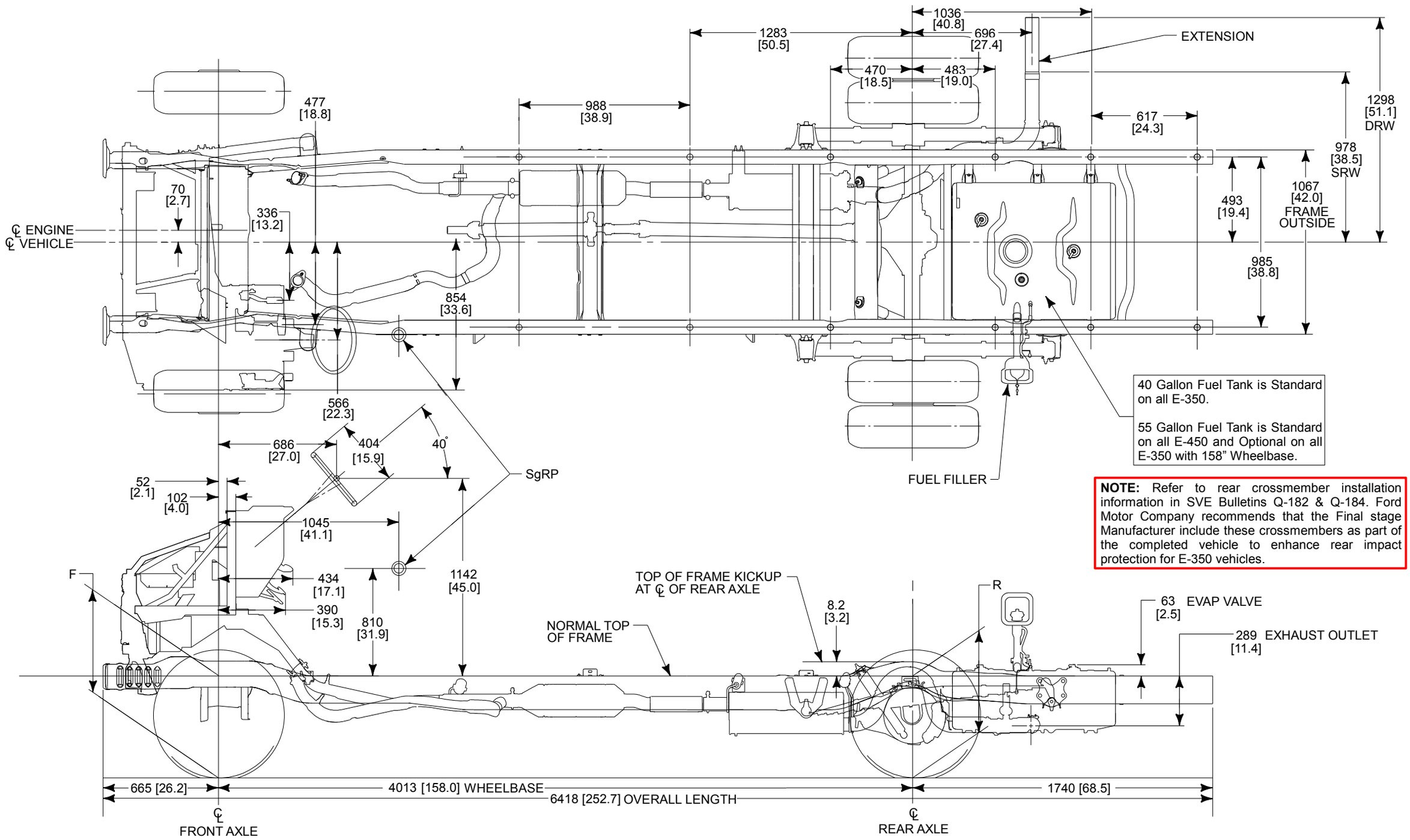
E-SERIES
DIMENSIONAL DATA
E-350 SUPER DUTY STRIPPED CHASSIS 138” WB (DRW)



NOTE: Refer to rear crossmember installation information in SVE Bulletins Q-182 & Q-184. Ford Motor Company recommends that the Final stage Manufacturer include these crossmembers as part of the completed vehicle to enhance rear impact protection for E-350 vehicles.

NOTE — [ ] DIMENSIONS ARE INCHES.

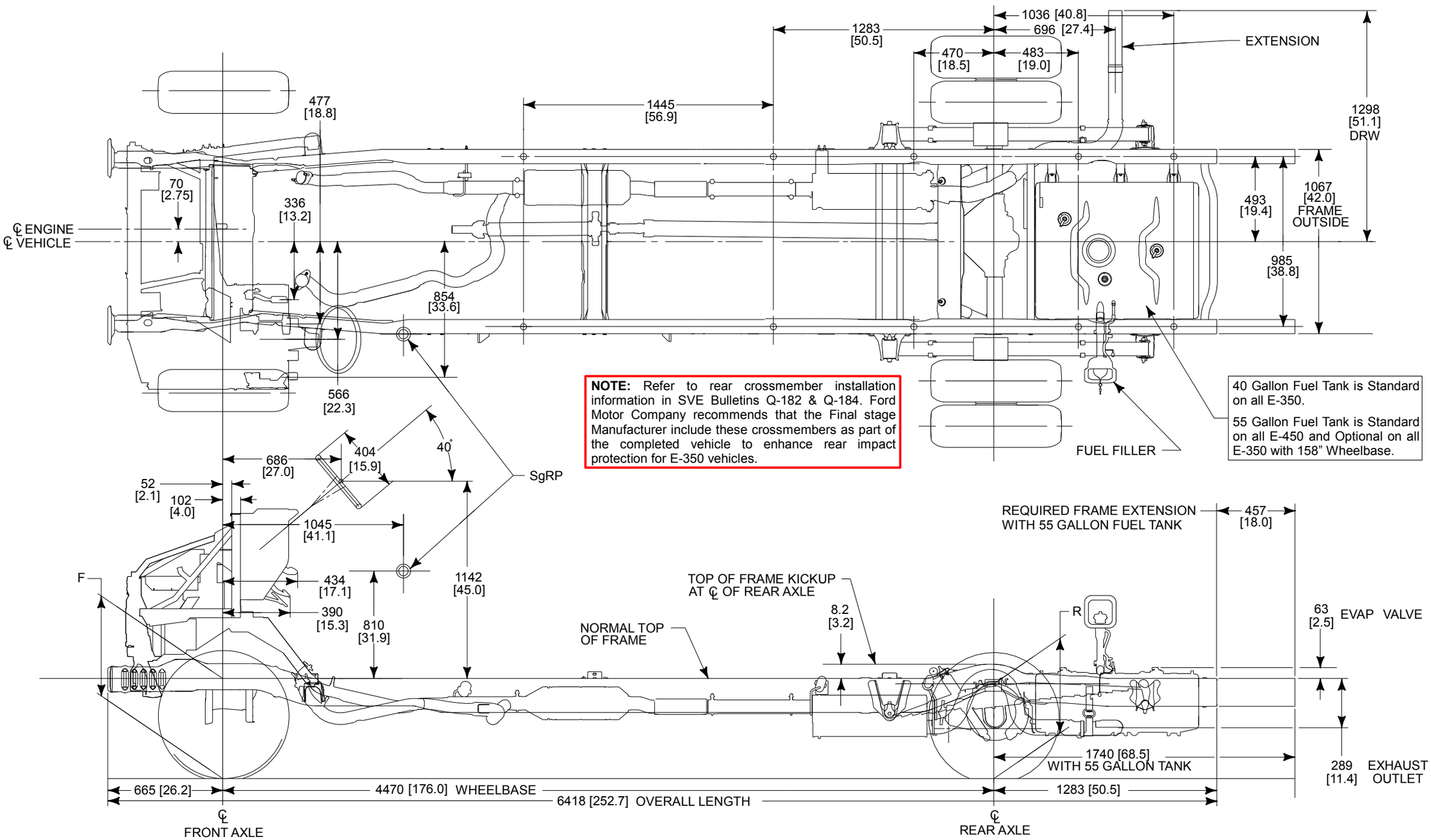
E-SERIES
DIMENSIONAL DATA
E-350 SUPER DUTY STRIPPED CHASSIS 158” WB (DRW)



NOTE: Refer to rear crossmember installation information in SVE Bulletins Q-182 & Q-184. Ford Motor Company recommends that the Final stage Manufacturer include these crossmembers as part of the completed vehicle to enhance rear impact protection for E-350 vehicles.

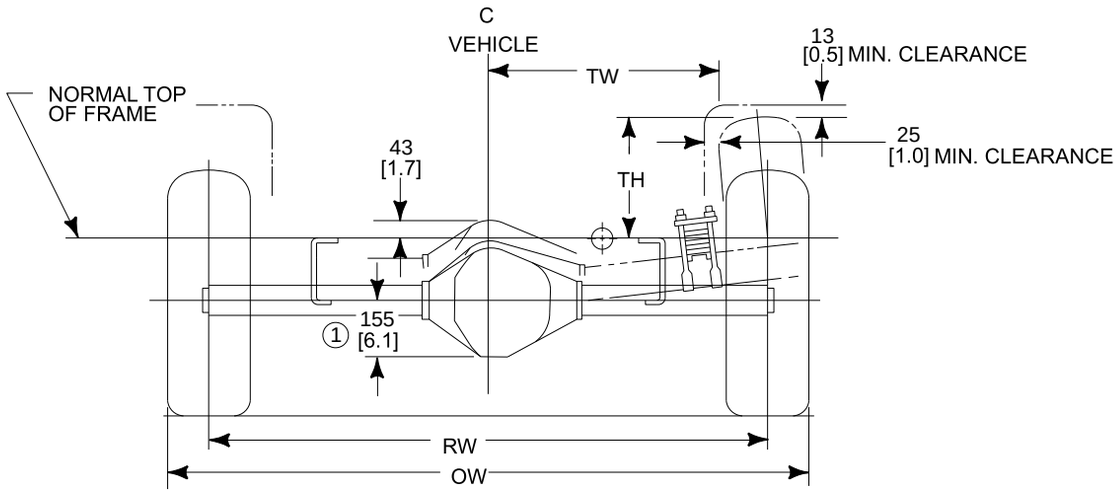
NOTE — [ ] DIMENSIONS ARE INCHES.

E-SERIES
DIMENSIONAL DATA
E-350/450 SUPER DUTY STRIPPED CHASSIS 176” WB (DRW)



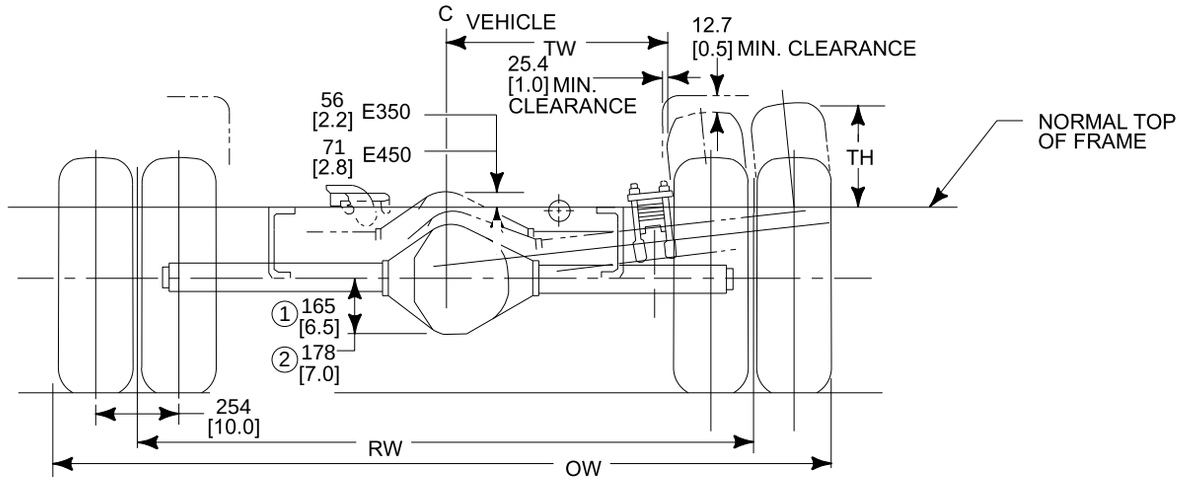
NOTE — [ ] DIMENSIONS ARE INCHES.

E-SERIES
AXLE / TIRE / WHEELHOUSE / VEHICLE HEIGHT DATA



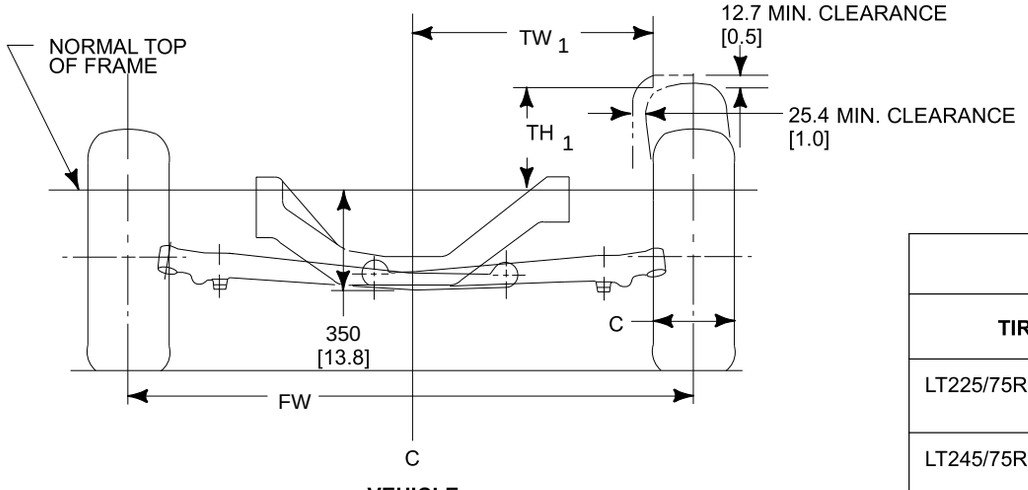
1 7800 LB AXLE USED AT 10,050 LB GVWR CUTAWAY APPLICATIONS

REAR SUSPENSION (SRW)
REAR VIEW



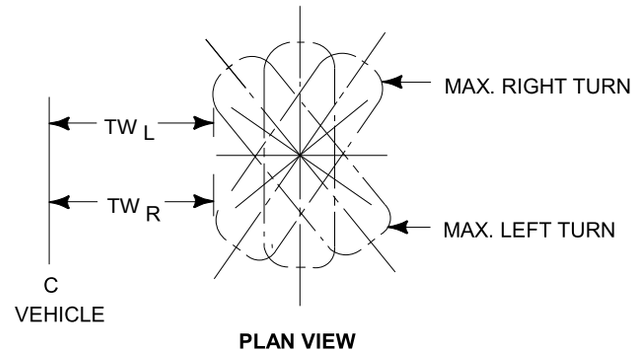
1 8500 LB AXLE USED AT 11,500, 12500 LB GVWR
2 9600 LB AXLE USED AT 14,000, 14500 LB GVWR FOR E-450

REAR SUSPENSION (DRW)
REAR VIEW



VEHICLE
FRONT SUSPENSION
FRONT VIEW

FRONT SUSPENSION				
TIRE	**TW 1**	**TH 1**	**TW L**	**TW R**
LT225/75R16E	655 [25.8]	302 [11.9]	549 [21.6]	521 [20.5]
LT245/75R16E	655 [25.8]	320 [12.6]	549 [21.6]	521 [20.5]



PLAN VIEW
LEFT FRONT TIRE

TW = DISTANCE FROM C OF VEHICLE TO SIDE OF TIRE IN MODIFIED JOUNCE.
TH = DISTANCE FROM NORMAL TOP OF FRAME TO TOP OF TIRE IN MODIFIED JOUNCE.

NOTE — [ ] DIMENSIONS ARE INCHES.

(Cont'd next page)

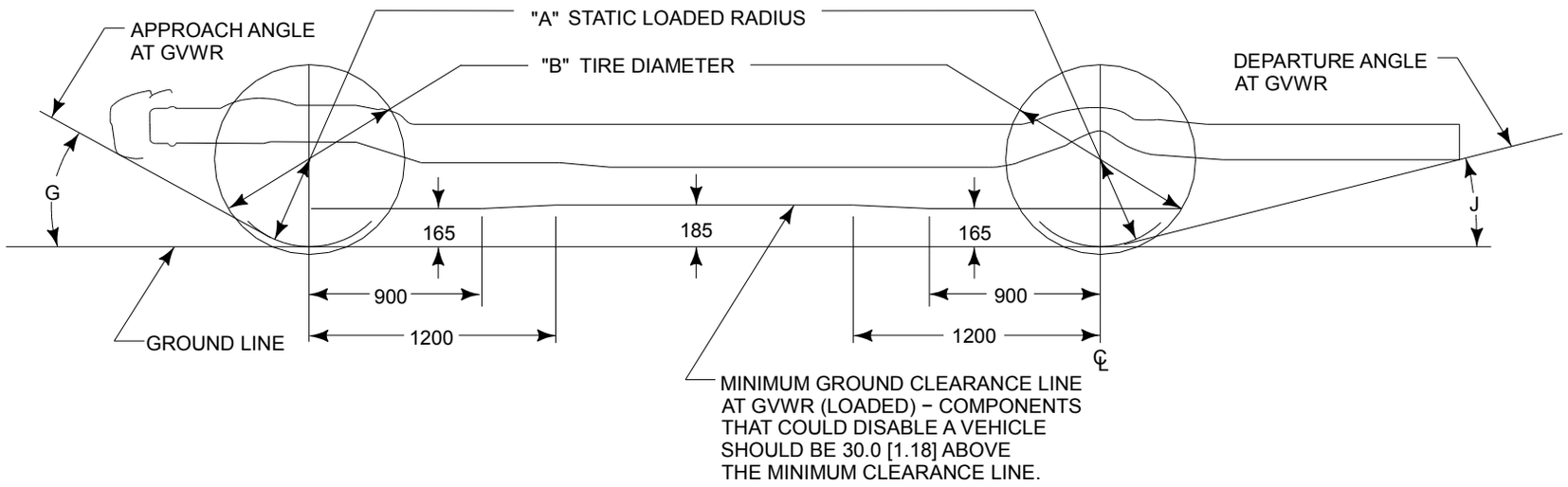
E-SERIES
AXLE / TIRE / WHEELHOUSE / VEHICLE HEIGHT DATA (Cont'd)

MODEL	WB inches	GVWR pounds	MINIMUM TIRE	FRONT GAWR MIN/MAX pounds	COMBINED FRONT SPRING CAPACITY RATE pounds	F HEIGHT AT FRONT AXLE (1)		REAR GAWR MAX pounds	COMBINED REAR SPRING CAPACITY RATE pounds	R HEIGHT AT REAR AXLE (1)		CH OVERALL HEIGHT OF VEHICLE (STANDARD SPRINGS) (1) mm [in]	
						BASE CURB WEIGHT mm [in]	LOADED mm [in]			BASE CURB WEIGHT mm [in]	LOADED mm [in]		
					STD SPRING	STD SPRING	STD SPRING		STD SPRING	STD SPRING	STD SPRING	CURB	LOADED
CUTAWAY													
E-350 SD	138	10,050 SRW	LT245/75R16E	4050/4200	4050/4200	577 [22.7]	528 [20.8]	6084	7810	652 [25.7]	576 [22.7]	2099 [82.6]	2040 [80.3]
		11,500 DRW	LT225/75R16E	4050/4600	4600	571 [22.5]	525 [20.7]	7800	8600	658 [25.9]	583 [23.0]	2098 [82.6]	2039 [80.3]
	158	10,050 SRW	LT245/75R16E	4200	4200	600 [23.6]	532 [21.0]	6084	7810	676 [26.5]	576 [22.7]	2121 [83.5]	2040 [80.3]
		11,500 DRW		4050/4600	4050/4600	572 [22.5]	525 [20.7]	7800	8600	657 [25.9]	583 [23.0]	2094 [82.4]	2043 [80.4]
		12,500 DRW	LT225/75R16E	4600/5000	4600/5000	591 [23.3]	523 [20.6]	8500	8600	664 [26.1]	582 [22.9]	2109 [83.0]	2034 [80.1]
	176	12,500 DRW		4600/5000	5000	582 [22.9]	524 [20.6]	8500	8600	665 [26.1]	582 [22.9]	2100 [82.7]	2032 [80.0]
E-450 SD	158	14,000 DRW	LT225/75R16E	4600/5000	4600/5000	592 [23.3]	523 [20.6]	9600	9600	691 [27.2]	608 [23.9]	2118 [83.4]	2045 [80.5]
		14,500 DRW		5000	5000	596 [23.5]	521 [20.5]	9600	9600	691 [27.2]	608 [23.9]	2121 [83.5]	2033 [80.1]
	176	14,000 DRW		4600/5000	4600/5000	586 [23.1]	521 [20.5]	9600	9600	692 [27.2]	608 [23.9]	2112 [83.1]	2042 [80.4]
		14,500 DRW		5000	5000	594 [23.4]	521 [20.5]	9600	9600	692 [27.2]	608 [23.9]	2116 [83.3]	2042 [80.4]
STRIPPED CHASSIS													
E-350 SD	138	11,500 DRW	LT225/75R16E	4200/4600	4600	608 [23.9]	524 [20.7]	7800	7800	657 [25.9]	583 [23.0]	—	—
	158	12,500 DRW		4600/5000	5000	618 [24.3]	523 [20.6]	8500	8500	664 [26.1]	582 [22.9]	—	—
	176	12,500 DRW		4600/5000	5000	616 [24.3]	523 [20.6]	8500	8500	664 [26.1]	582 [22.9]	—	—
E-450 SD	158	14,000 DRW		4600/5000	5000	617 [24.3]	523 [20.6]	9500	9500	693 [27.3]	608 [23.9]	—	—
		14,500 DRW		5000	5000	624 [24.4]	521 [20.5]	9500	9500	693 [27.3]	608 [23.9]	—	—
	176	14,000 DRW		4600/5000	5000	—	522 [20.6]	9500	9500	—	577 [22.7]	—	—
		14,500 DRW		5000	5000	—	521 [20.5]	9500	9500	—	579 [22.8]	—	—

(1) The Height Data shown represents dimensions of a nominal vehicle with no options. Actual height may vary due to production tolerances.
SRW - Single Rear Wheels
DRW - Dual Rear Wheels

NOTE — [ ] DIMENSIONS ARE INCHES.

E-SERIES
GROUND CLEARANCE
APPROACH & DEPARTURE ANGLES



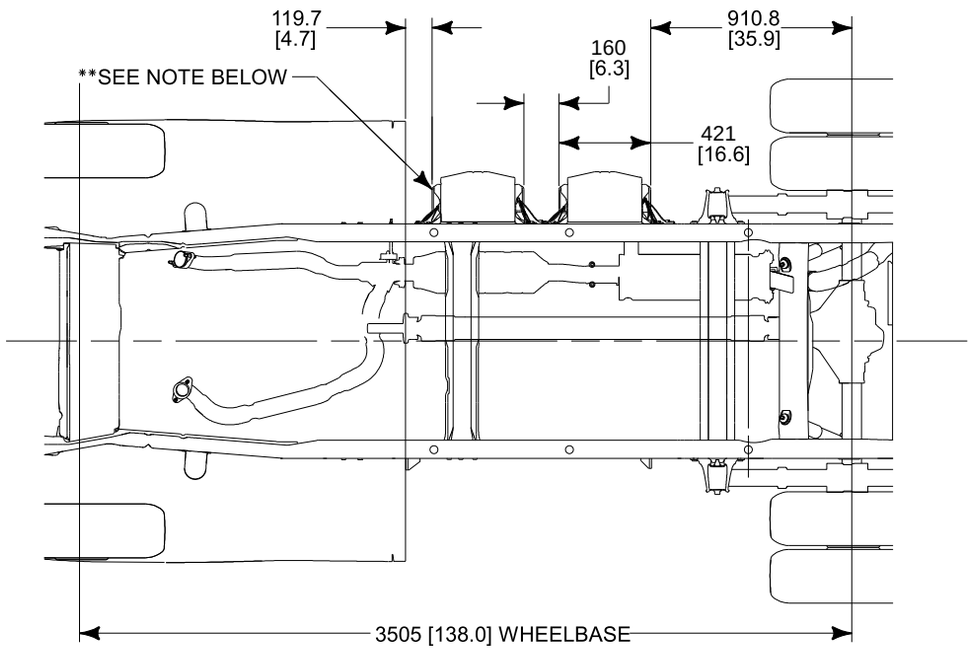
BASE VEHICLE LOADED

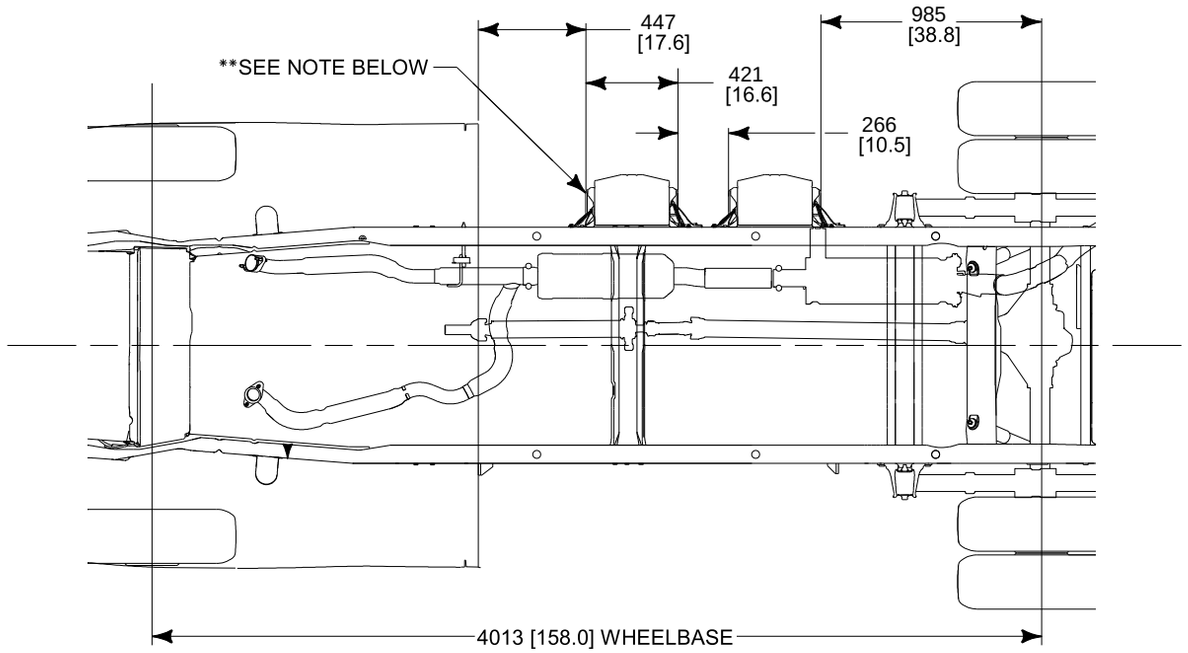
MODEL	TIRE SIZE	ALL SEASON TIRE DATA				TREAD WIDTH		OW	TH	TW	GROUND CLEARANCE					
		A	B	C		FW	RW	OVERALL WIDTH	STD	STD	G			J		
											APPROACH ANGLE			DEPARTURE ANGLE		
		STATIC LOADED RADIUS	MAX. DIAMETER	MAX. SECTION WIDTH	RIM WIDTH	FRONT	REAR	REAR	SPRING	SPRING	138" WB	158" WB	176" WB	138" WB	158" WB	176" WB
E-350 Cutaway SRW (Aft-of-Axle Fuel Tank)	LT245/75R16E	356 [14.0]	787 [31.0]	263 [10.3]	178 [7.0]	1763 [69.4]	1831 [72.1]	2094 [82.4]	307 [12.1]	710 [28.0]	21°	N/A	N/A	15°	N/A	N/A
E-350 Cutaway DRW	LT225/75R16E	346 [13.6]	757 [29.8]	236 [9.3]	152 [6.0]	1763 [69.4]	1915 [75.4]	2405 [94.7]	329 [12.9]	684 [26.9]	22°	22°	22°	15°	15° ♦	20° ♦
E-450 Cutaway DRW		346 [13.6]	757 [29.8]	236 [9.3]	152 [6.0]	1763 [69.4]	1974 [77.7]	2464 [97.0]	325 [12.8]	743 [29.2]	N/A	27°	27°	N/A	16° ♦	21° ♦
E-350 Stripped Chassis DRW		346 [13.6]	757 [29.8]	236 [9.3]	152 [6.0]	1763 [69.4]	1915 [75.4]	2405 [94.7]	329 [12.9]	684 [26.9]	40°	33°	34°	21°	18°	24°
E-450 Stripped Chassis DRW		346 [13.6]	757 [29.8]	236 [9.3]	152 [6.0]	1763 [69.4]	1974 [77.7]	2464 [97.0]	325 [12.8]	743 [29.2]	N/A	39°	35°	N/A	16° ♦	18° ♦

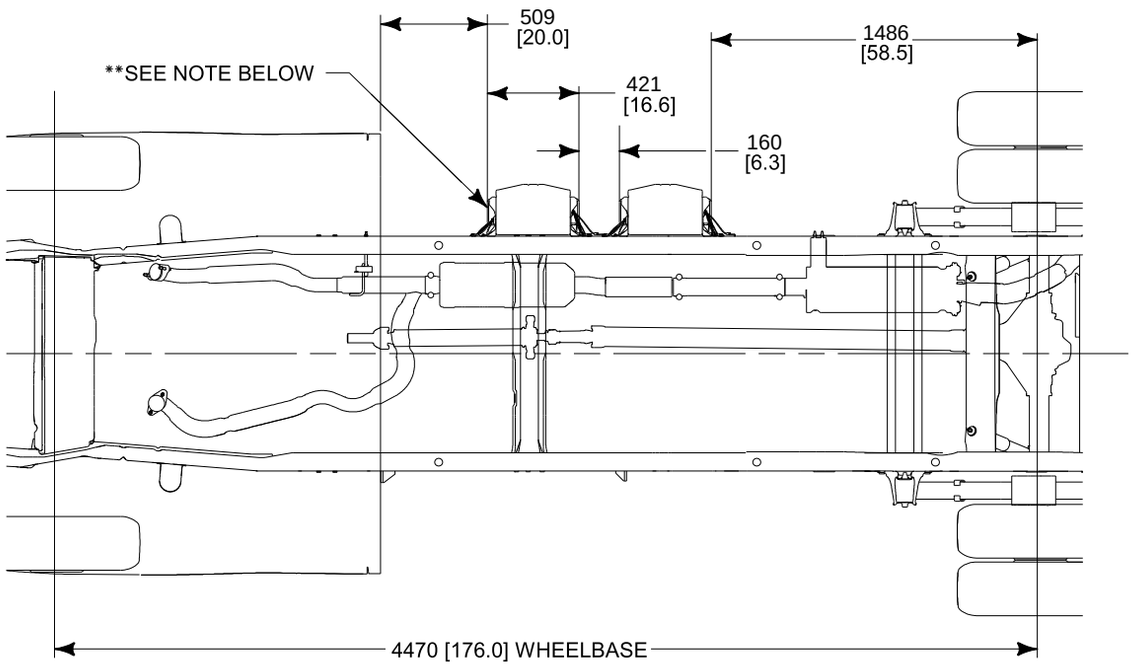
♦ 55-gallon tank and 18 inch frame extension

NOTE — [ ] DIMENSIONS ARE INCHES.

E-SERIES
BATTERY BOX LOCATIONS
E-350/450 DUAL BATTERIES & GASOLINE W/ AUXILIARY BATTERY





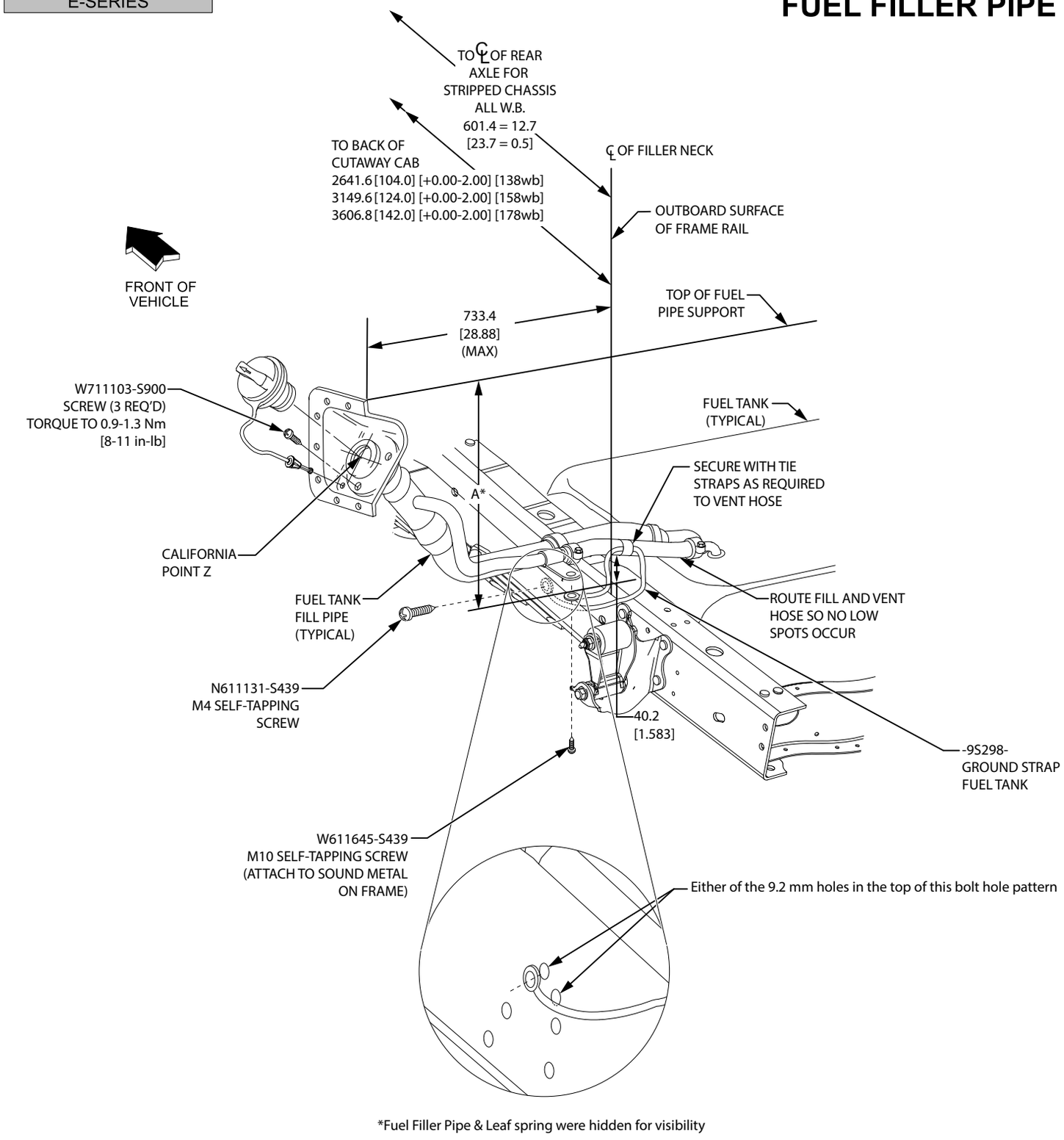


The guidelines below must be followed when repositioning the battery box

- Maintain attachment hole diameter of (12 mm)
- Maintain use of existing OEM bolts (M10)
- The battery box must NOT be packaged any lower in vehicle position than is provided by Ford
- All new frame holes must be at least 1x hole diameter away from all other holes & 1½ diameter away from the edge of a radius tangent
- Battery boxes may not be moved rearward of position provided by Ford

NOTES — [ ] DIMENSIONS ARE INCHES.
— ** PLACEMENT FOR GAS ENGINES W/ AUXILIARY BATTERY OPTION.

E-SERIES
FUEL FILLER PIPE


TO ℄ OF REAR AXLE FOR STRIPPED CHASSIS ALL W.B. 601.4 = 12.7 [23.7 = 0.5]
TO BACK OF CUTAWAY CAB
2641.6 [104.0] [+0.00-2.00] [138wb]
3149.6 [124.0] [+0.00-2.00] [158wb]
3606.8 [142.0] [+0.00-2.00] [178wb]
℄ OF FILLER NECK
OUTBOARD SURFACE OF FRAME RAIL
FRONT OF VEHICLE
TOP OF FUEL PIPE SUPPORT
733.4 [28.88] (MAX)
W711103-S900 SCREW (3 REQ'D) TORQUE TO 0.9-1.3 Nm [8-11 in-lb]
FUEL TANK (TYPICAL)
SECURE WITH TIE STRAPS AS REQUIRED TO VENT HOSE
A*
CALIFORNIA POINT Z
FUEL TANK FILL PIPE (TYPICAL)
ROUTE FILL AND VENT HOSE SO NO LOW SPOTS OCCUR
N611131-S439 M4 SELF-TAPPING SCREW
40.2 [1.583]
-9S298- GROUND STRAP FUEL TANK
W611645-S439 M10 SELF-TAPPING SCREW (ATTACH TO SOUND METAL ON FRAME)
Either of the 9.2 mm holes in the top of this bolt hole pattern

*Fuel Filler Pipe & Leaf spring were hidden for visibility

Maintain minimum 50 mm [2.0 in] clearance between fuel system components and frame/subframe body structures including floor pan and body cross memebers. There shall be no sharp edges nor fasteners pointing towards fuel tank.

NOTES:

FACE Of FILLER PIPE SUPPORT TO BE INSTALLED ON B0DY IN VERTICAL PLANE

▽TORQUE ALL WORM GEAR DRIVEN HOSE CLAMPS TO 4.0 - 4.5 Nm. [35 - 40 in-lbs.]

[ ] DIMENSIONS ARE INCHES

*A - FUEL SYSTEM FILLER HEIGHT
SCHOOL BUS :395 [15.6] MINIMUM
OTHER: 319 [12.6] MINIMUM

▽ CRITICAL CONTROL ITEM

SECOND UNIT BODY MOUNTING
E-SERIES CUTAWAY

E-SERIES SUPER DUTY CUTAWAY SUB MOUNTING SYSTEM

FORD OPTIONAL SPACERS

Ford provides optional SUB mounting spacers which will isolate the SUB from the frame. The SUB should be attached to these spacers using all the provided holes in the spacer with a suggested minimum 7/16-14 UNC grade 8 fastener. These fasteners should be directed away from any fuel system component or should not extend more than 25.4 mm [1.00 in] below the spacer flange. The rubber isolators on the spacers are capable of 19.0 mm [0.75 in] movement from a static (design) position, which is the same for the isolators that mount the cutaway body to frame. This will minimize squeaks, rattles and water or air leaks at the mounting surface of the SUB, to the cutaway body. The Ford optional spacers will accommodate the recommended fuel fill neck installation and a recommended 101.6 mm [4.00 in] minimum clearance between the frame and the bottom of the SUB (except at the rear axle kick-up area).

NON-FORD SPACERS

Vehicles not equipped with the Ford optional spacers have 34.8 mm [1.37 in] diameter holes on the upper flange of the frame sidemembers for body to frame isolators. The density/durometer, size and quantity of these isolators should be based on the SUB weight plus the projected payload of the completed vehicle, within the limits of the GAWRs and GVWR, as determined by the final stage manufacturer.

NO SPACERS

If the final stage manufacturer chooses to attach the SUB (or other components) to the frame by bolting or welding, the following restrictions are to be followed:

1. The frame rail flanges, including the flange bend radius, must not be drilled or welded upon. Also, flanges may not be cut/trimmed to provide clearance to added hardware or structure.
2. When bolting the SUB (or other components) to the frame, follow the guidelines in the Pickup Box Delete section.

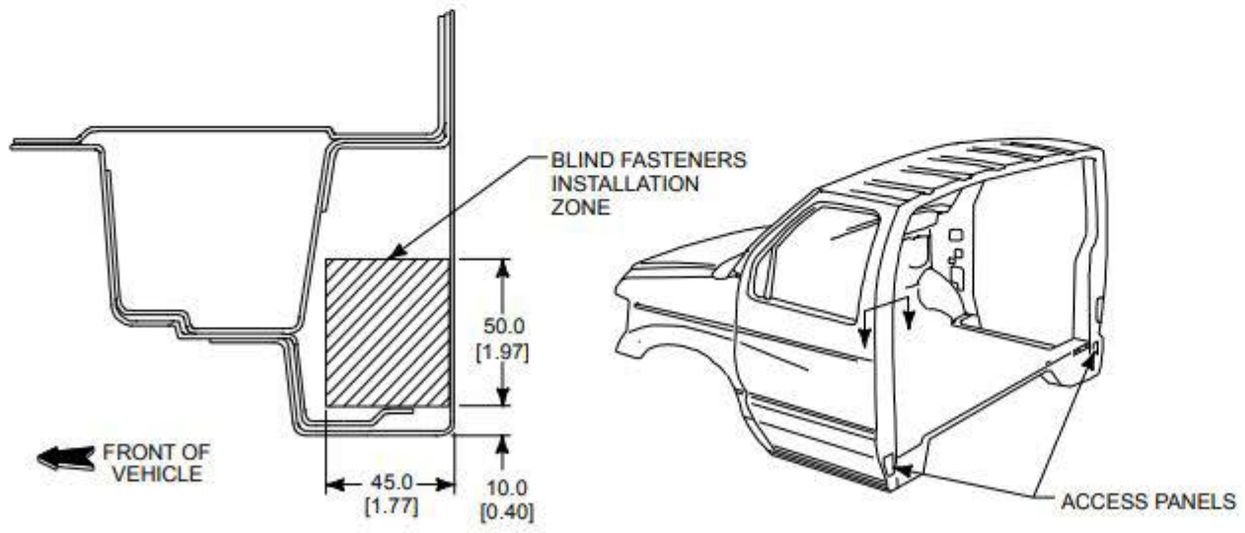
Note that hard mounting of the SUB to the frame and to the cutaway body may result in NVH and cutaway body durability issues.

NOTES

4470 mm [176 in] wheelbase vehicles equipped with a 55 gallon fuel tank will require a 457 mm [18.00 in] minimum frame extension to provide for an adequate departure angle.

The attachment of the SUB to the cutaway body should consider the following:

1. Blind installation of self-expanding nut type fasteners can be located in the zone as defined in the figure on this page, and should allow for functional expansion, and be equally spaced. The body edge flange may also be used for fasteners provided the center of the required hole is 1.5 times the hole diameter from the edge of the panel. These recommendations apply to both B-pillar attachment.
2. Removal of the access panel and fasteners at the lower area of the B-pillar will allow for flush mounting of the SUB. This opening should be completely covered and sealed from obvious climatic conditions.
3. Roof attachments should be equally spaced and are permitted on the flange provided. The center of the required holes should be 1.5 times the hole diameter from the edge of the flange.
4. Floor attachments should be equally spaced and are permitted on the flange provided. The center of the required holes should be 1.5 times the hole diameter from the edge of the panel.
5. Washers or doublers should be considered to increase the bearing surface under fasteners to increase joint integrity and to decrease sheet metal fatigue, squeaks, and rattles.
6. Gaskets or sealers installed between the cutaway body and the SUB should consider the displacement and stabilization of such materials when clamped, and the effect on joint integrity.



E-SERIES SUPER DUTY CUTAWAY BODY TO SECOND UNIT BODY ATTACHMENT

NOTE — [ ] DIMENSIONS ARE INCHES.

SECOND UNIT BODY MOUNTING
E-SERIES STRIPPED CHASSIS

E-350/450 SUPER DUTY STRIPPED CHASSIS SECOND UNIT BODY

A full length structural body should be attached to the chassis utilizing a system of body bolsters bolted and welded to the chassis frame sidemember as shown on this page.

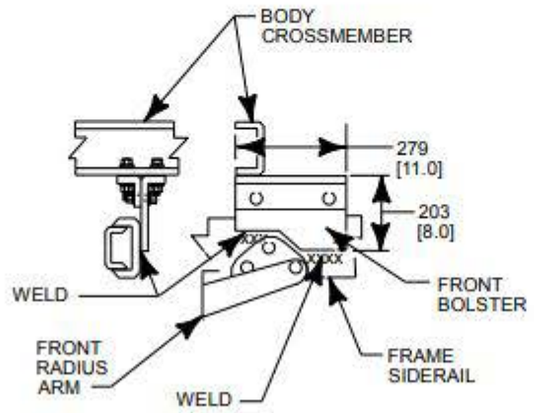
Rear body bolsters extend along the parallel sections of the frame sidemember using the existing 34.8 mm [1.4in] diameter holes as shown in View B, on this page.

Bolster attachment in the rear axle kick-up area can be accomplished by bolting shear plates to the web of the frame sidemember as shown in View C, on this page. The maximum size hole that may be drilled in the frame web is 19 mm [0.75 in] diameter. Refer to the drilling precautions in the Design section.

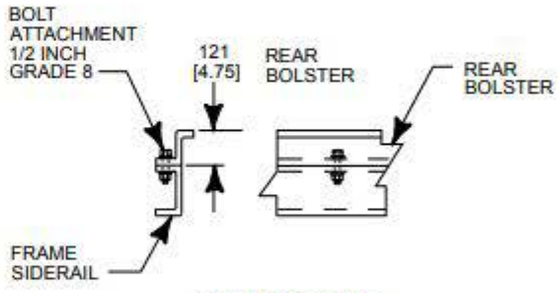
Front body bolsters should be attached to the frame sidemember as far forward as possible. They should be welded to the web of the frame sidemember immediately to the rear of the front radiator and cowl support structure as shown in View A. Front bolsters should not be bolted to the frame sidemember in this area since there is no access to the inside surface sidemember.

Each front bolster should be rigidly connected to the corresponding rear bolster through the body floor or a tie bar.

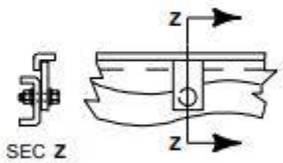
Do not weld to the flanges of the side rail. Refer to the welding precautions in the Design section.



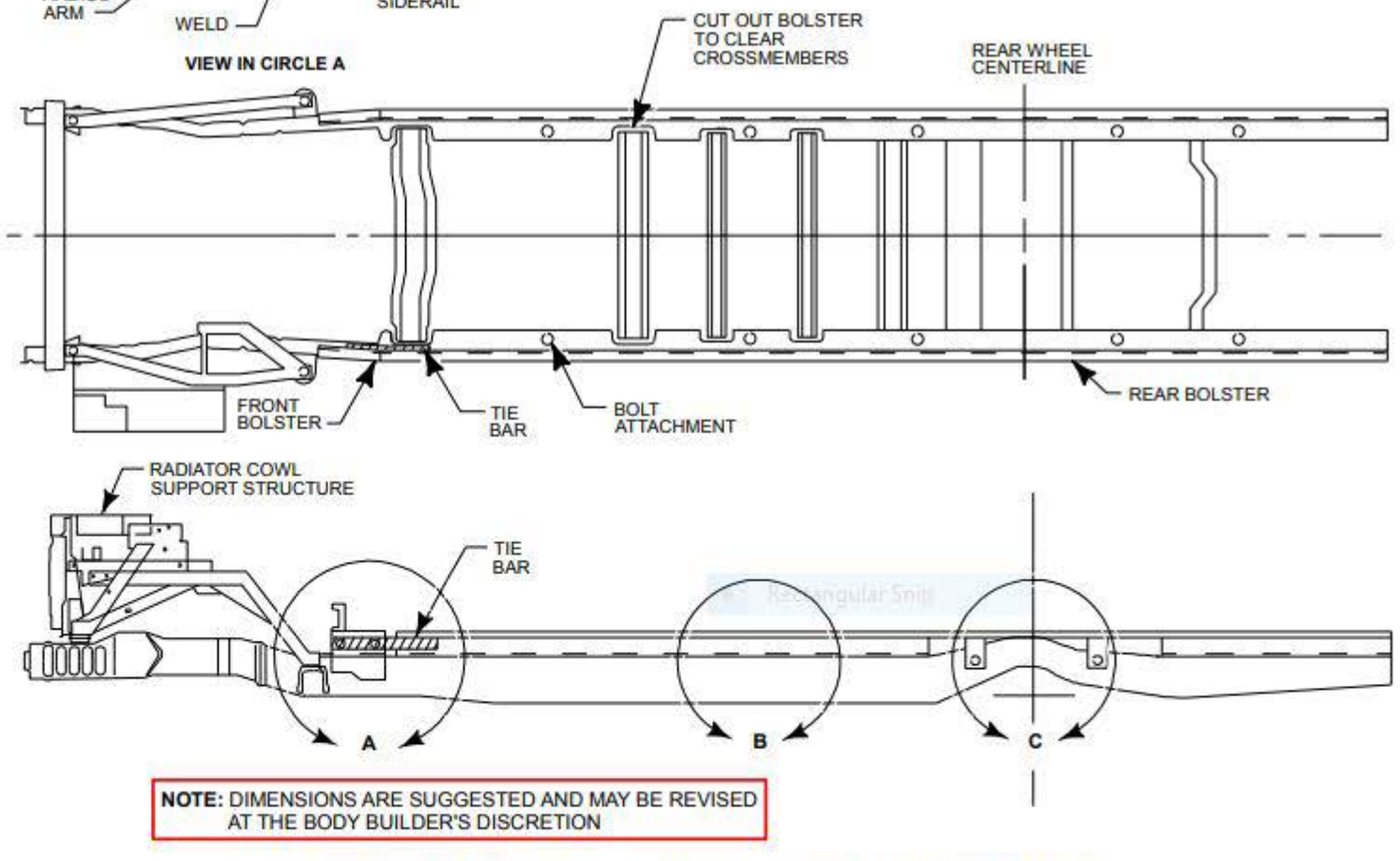
VIEW IN CIRCLE A



VIEW IN CIRCLE B



VIEW IN CIRCLE C

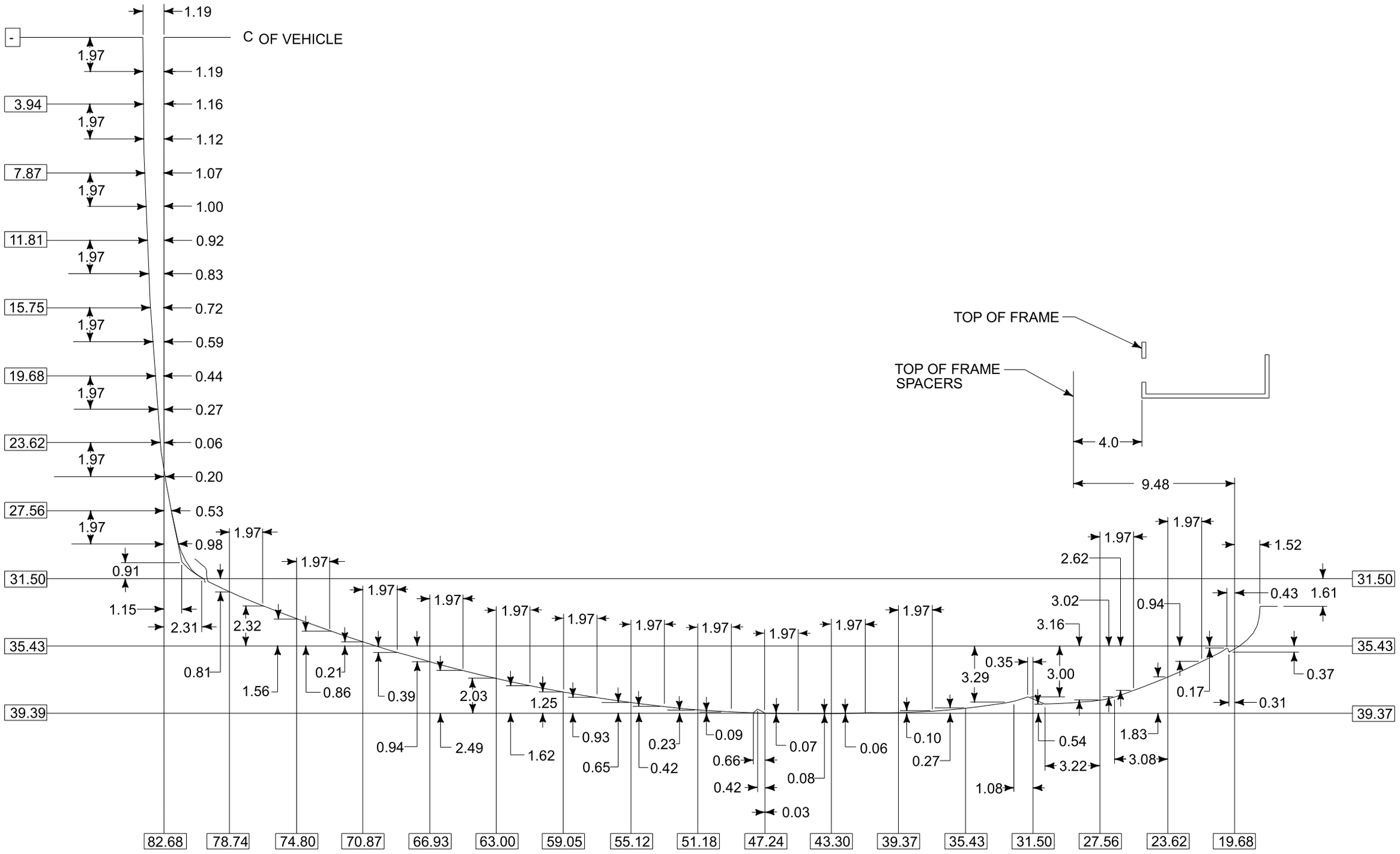


NOTE: DIMENSIONS ARE SUGGESTED AND MAY BE REVISED AT THE BODY BUILDER'S DISCRETION

E-350/450 SUPER DUTY STRIPPED CHASSIS SECOND UNIT BODY INSTALLATION

NOTE — [ ] DIMENSIONS ARE INCHES.

E-SERIES
BACK OF CAB PROFILE DIMENSIONS
CUTAWAY BODY SECTION “A”



NOTE — [ ] DIMENSIONS ARE INCHES.

E-SERIES
CUTAWAY / STRIPPED CHASSIS FRONTAL AREA RESTRICTIONS

All 2021MY E-Series vehicles have a 7.3L Gas engine which is certified using the Heavy Duty Engine Protocol (Dyno Cert), and therefore do not require Frontal Area or Unloaded Vehicle Weight Restrictions in order to meet emissions standards. However, there are Frontal Area Restrictions required to maintain optimal vehicle performance in all conditions. If the Frontal Areas in Table A are exceeded, engine output may be reduced in extreme situations to maintain safe operating temperatures. The vehicle may be completed up to the "Standard" max frontal area with no SUB radii restrictions and up to the "Enhanced" max frontal area if the radii restrictions in Figure A (for Cutaways) and Figure B (for Stripped Chassis) are followed.

TABLE A - FRONTAL AREA RESTRICTIONS FOR COMPLETED CUTAWAYS AND STRIPPED CHASSIS

Series	Engine	Final Drive Ratio	Standard Max Frontal Area (no SUB Radii Restrictions) (ft^2)	Enhanced Max Frontal Area (with SUB Radii Restrictions) (1) (ft^2)
E-350	7.3L Economy	4.10	77	84
		4.56	78	85
	7.3L Premium	4.10	79	86
		4.56	82	89
E-450	7.3L Economy	4.56	78	85
	7.3L Premium	4.56	82	89

(1) For vehicles completed with Frontal Area larger than the Standard Max value, radii restrictions shown in Figure A for Cutaways and Figure B for Stripped Chassis will be necessary to maintain optimal vehicle performance

FIGURE A – SECOND UNIT BODY RADII RESTRICTIONS FOR COMPLETED CUTAWAYS

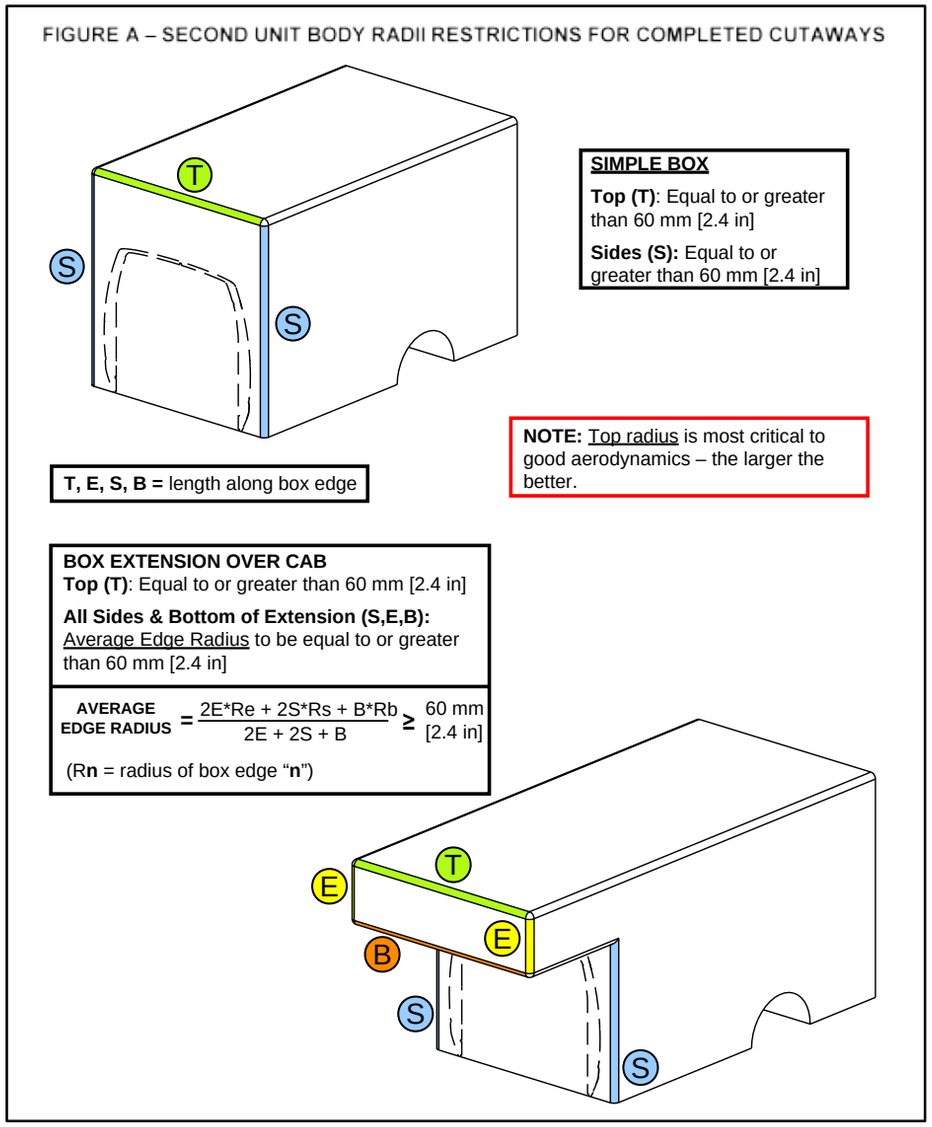
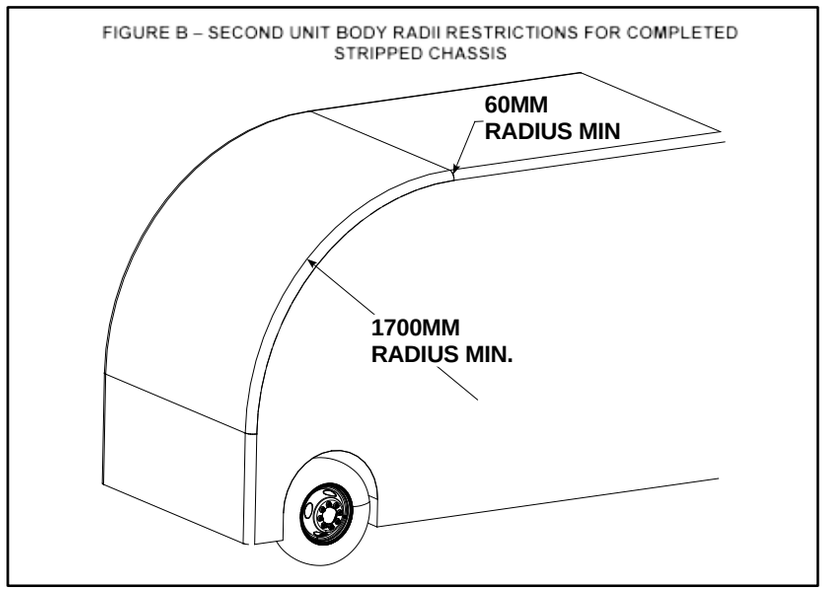


FIGURE A – SECOND UNIT BODY RADII RESTRICTIONS FOR COMPLETED CUTAWAYS
T
S
S
SIMPLE BOX
Top (T): Equal to or greater than 60 mm [2.4 in]
Sides (S): Equal to or greater than 60 mm [2.4 in]
NOTE: Top radius is most critical to good aerodynamics – the larger the better.
T, E, S, B = length along box edge
BOX EXTENSION OVER CAB
Top (T): Equal to or greater than 60 mm [2.4 in]
All Sides & Bottom of Extension (S,E,B): Average Edge Radius to be equal to or greater than 60 mm [2.4 in]
AVERAGE EDGE RADIUS = 2E*Re + 2S*Rs + B*Rb / 2E + 2S + B ≥ 60 mm [2.4 in]
(Rn = radius of box edge "n")
T
E
E
B
S
S

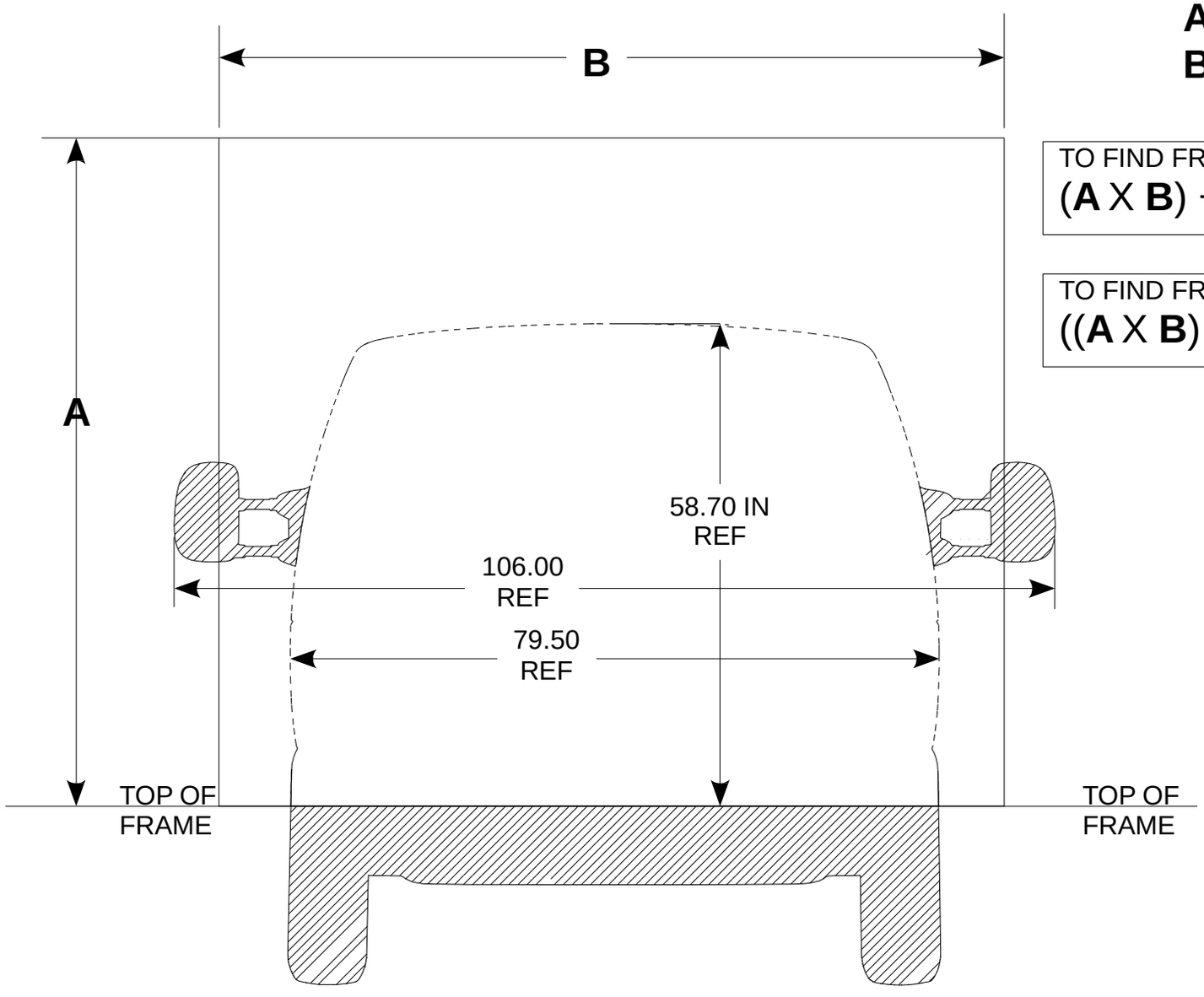


Calculating Frontal Area

Worksheets on pages 24 and 25 are provided to aid the final stage manufacturer in calculating frontal area. Total completed vehicle frontal area is calculated by taking the total frontal area of the Second Unit Body (SUB) and adding the frontal area of the chassis below the top of frame and the mirrors (Shaded area on the worksheet).

The final vehicle manufacturer will need to account for all aftermarket mirrors, equipment and second unit body areas.

E-SERIES - SRW
FRONT SURFACE AREA WORKSHEET
CHASSIS CAB / CUTAWAY



A = BOX HEIGHT IN INCHES
B = BOX WIDTH IN INCHES

TO FIND FRONT SURFACE AREA IN SQ INCHES
(**A** X **B**) + 1240.7 =

TO FIND FRONT SURFACE AREA IN SQ FEET
((**A** X **B**) / 144) + 8.62 =

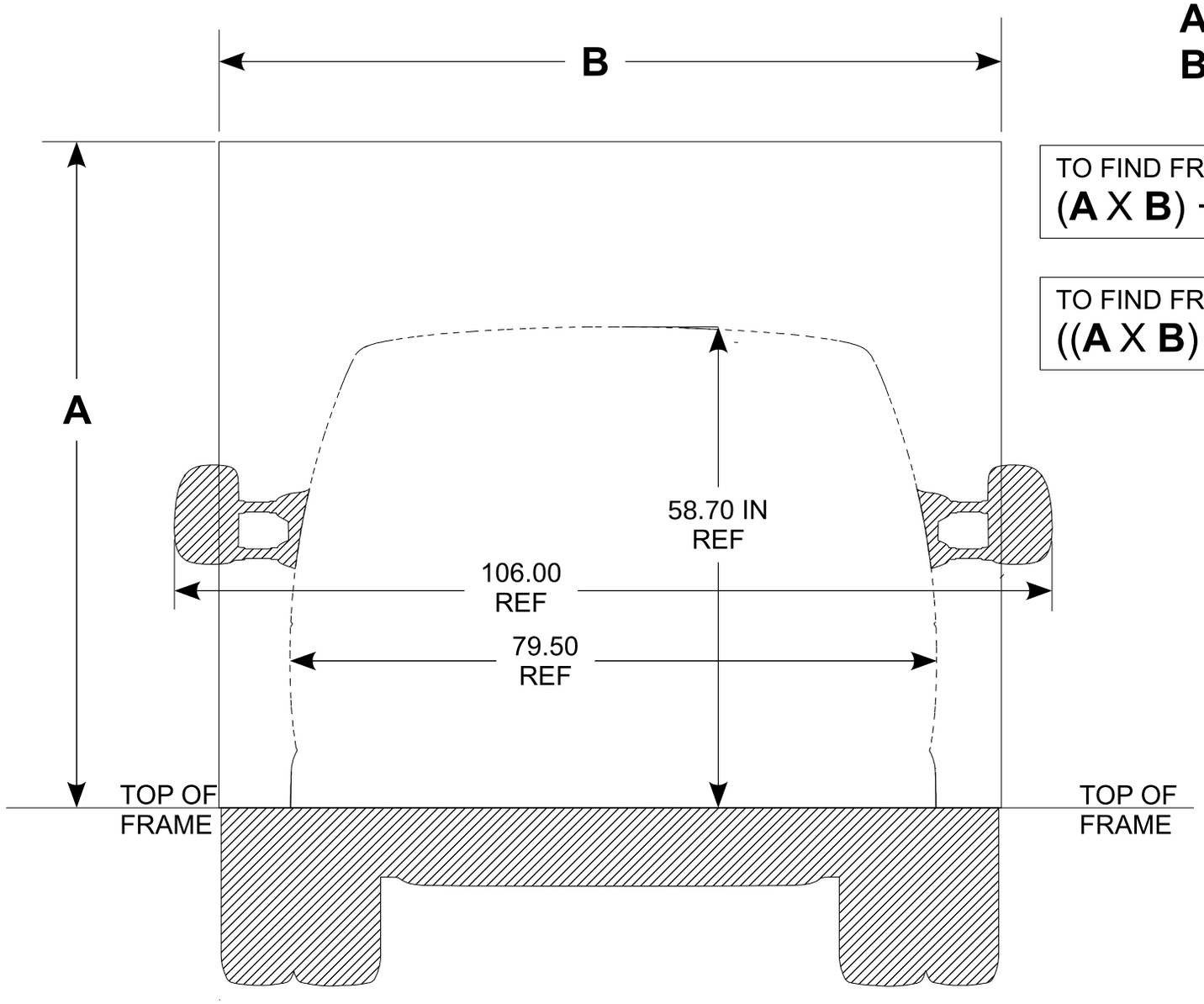
BELOW FRAME SHADED AREA EQUALS
624293 / (25.4 X 25.4) = 967.6560 SQ. IN.
967.6560 / (12 X 12) = 6.7198 SQ. FT.

MIRROR SHADED AREA EQUALS
(88087.6 X 2) / (25.4 X 25.4) = 273.0721 SQ. IN.
273.0721 / (12 X 12) = 1.8963 SQ. FT.

TOTAL SHADED AREA EQUALS
800468.2 / (25.4 X 25.4) = 1240.7281 SQ. IN.
1429.6698 / (12 X 12) = 8.6161 SQ. FT.

NOTE — DIMENSIONS ARE INCHES.

E-SERIES - DRW
FRONT SURFACE AREA WORKSHEET
CHASSIS CAB / CUTAWAY



A = BOX HEIGHT IN INCHES
B = BOX WIDTH IN INCHES

TO FIND FRONT SURFACE AREA IN SQ INCHES
(**A** X **B**) + 1632.1 =

TO FIND FRONT SURFACE AREA IN SQ FEET
((**A** X **B**) / 144) + 11.33 =

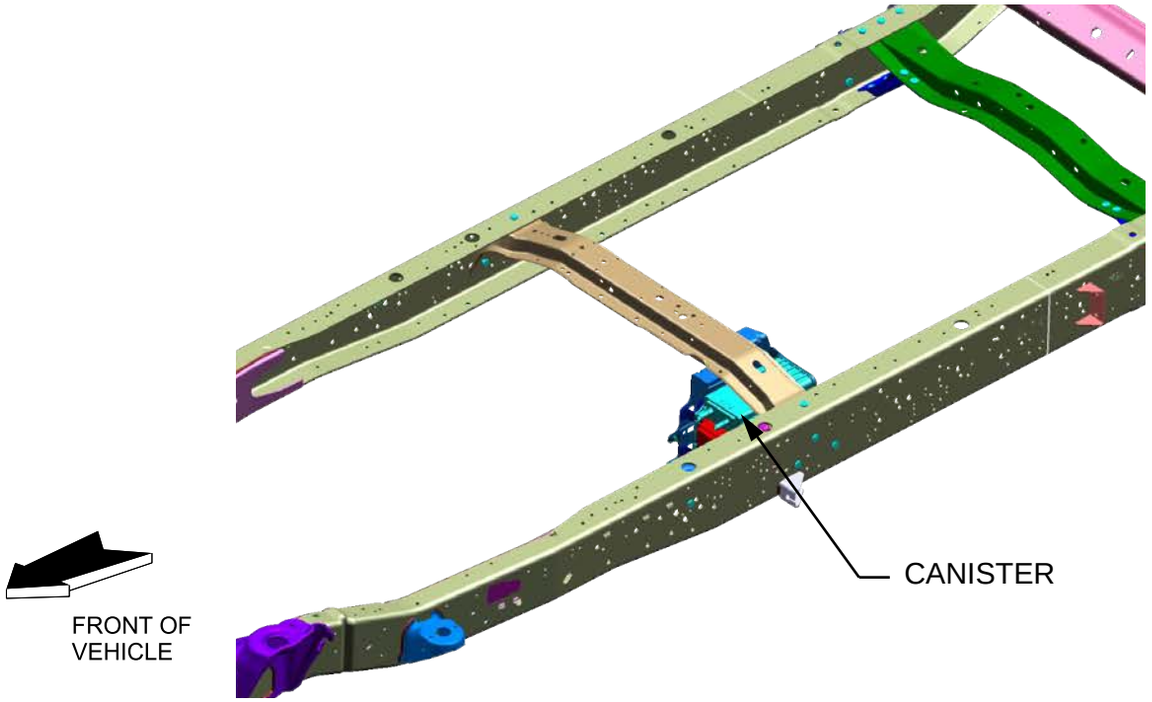
BELOW FRAME SHADED AREA EQUALS
876808.0 / (25.4 X 25.4) = 1359.0551 SQ. IN.
1359.0551 / (12 X 12) = 9.4379 SQ. FT.

MIRROR SHADED AREA EQUALS
(88087.6 X 2) / (25.4 X 25.4) = 273.0721 SQ. IN.
273.0721 / (12 X 12) = 1.8963 SQ. FT.

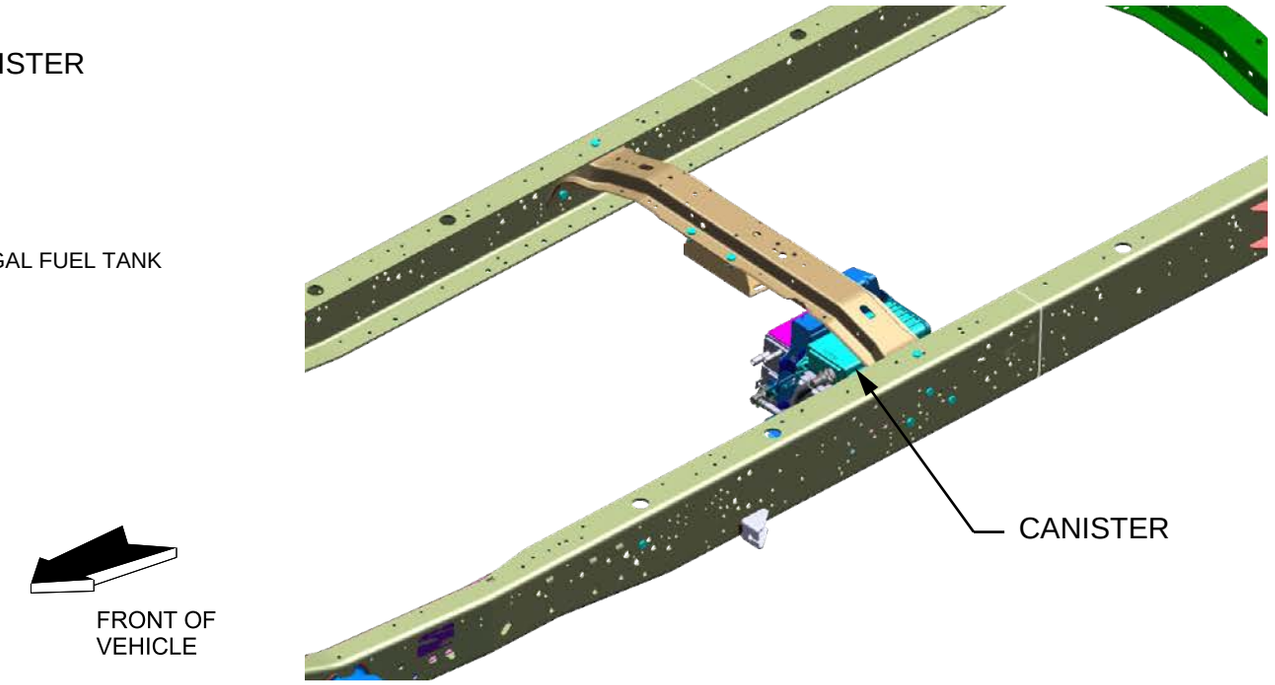
TOTAL SHADED AREA EQUALS
1052983.2 / (25.4 X 25.4) = 1632.1272 SQ. IN.
1632.1272 / (12 X 12) = 11.3342 SQ. FT.

NOTE — DIMENSIONS ARE INCHES.

E-SERIES
AFT-OF-AXLE FUEL TANK EVAPORATIVE EMISSIONS CANISTER LOCATION
CUTAWAY

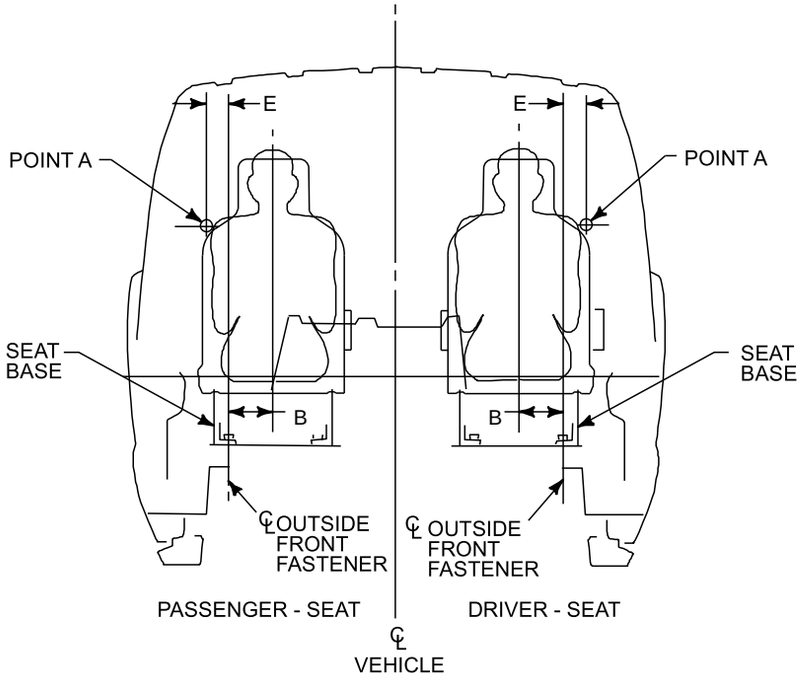


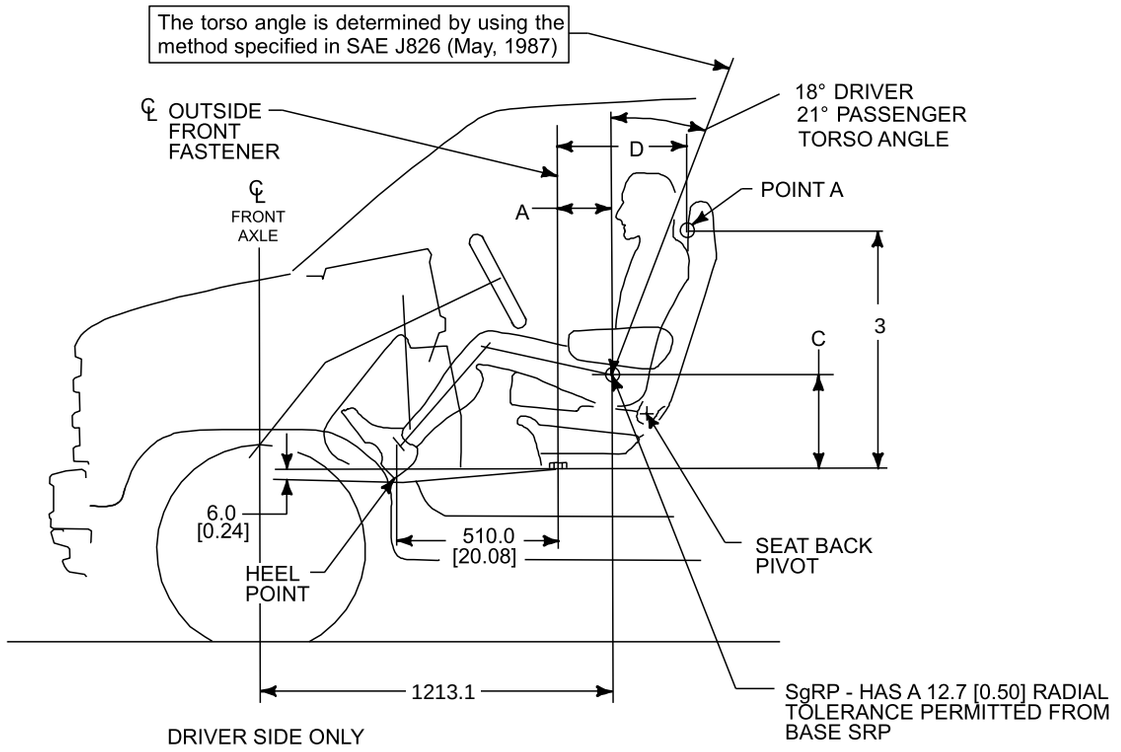
SINGLE CANISTER VARIANT THAT GOES ON VEHICLES WITH THE 40 GAL FUEL TANK



DUAL CANISTER VARIANT THAT GOES ON VEHICLES WITH THE 55 GAL FUEL TANK

E-SERIES
SEAT POSITION
E-250/350/450 SUPER DUTY CUTAWAY





IMPORTANT:
The dimensions in this figure require the vehicle to be at Design Position. E-Series vehicles at Design Position will be level front to rear, and side to side, on the upper surface of the ribbed floor panel from the B-pillar rearward.

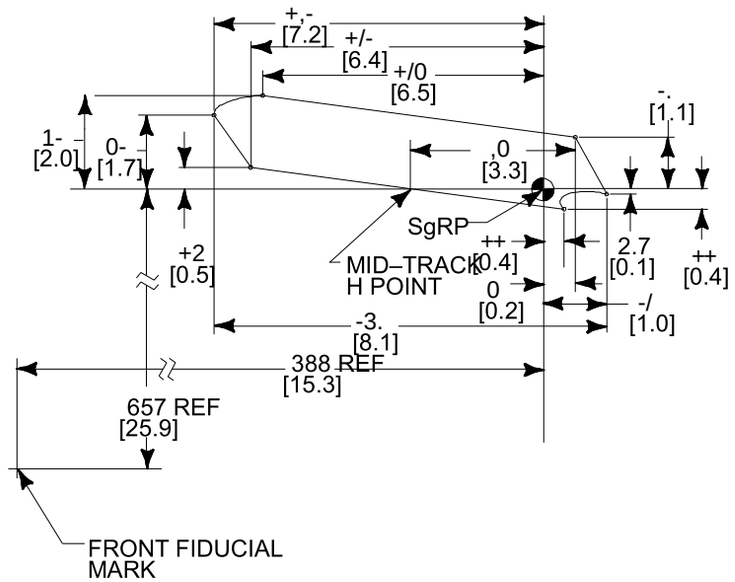
SRP INFORMATION (SEAT POSITION IS 10.0 mm [0.39] FORWARD OF REARMOST POSITION)				POINT A (SEAT POSITION IS AT THE MIDPOINT OF AVAILABLE TRAVEL)		
SEAT	**A**	**%**	**C**	**D**	**E**	**F**
DRIVER	217.8 [8.57]	105.0 [4.13]	384.2 [15.13]	356.0 [14.01]	67.0 [2.64]	937.4 [36.90]
PASSENGER	277.3 [10.92]	103.0 [4.06]	377.0 [14.84]	412.0 [16.22]	65.0 [2.56]	960.1 [37.80]

CODE	DESCRIPTION	DIMENSION
FRONT COMPARTMENT		
L34	MAXIMUM EFFECTIVE LEG ROOM – FRONT	1015 [40.0]
W3	SHOULDER ROOM – FRONT	1729 [68.1]
W5	HIP ROOM – FRONT	1667 [65.6]
W117	BODY WIDTH AT H-POINT	1996 [78.6]
H61	EFFECTIVE HEAD ROOM – FRONT	1070 [42.1]

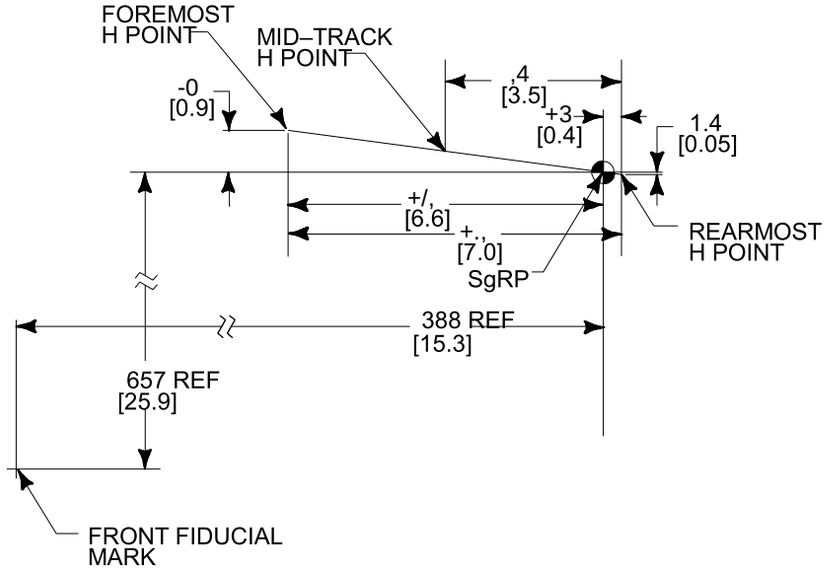
NOTE — [ ] DIMENSIONS ARE INCHES.

E-SERIES
SEAT TRACK TRAVEL / H-POINT LOCATION

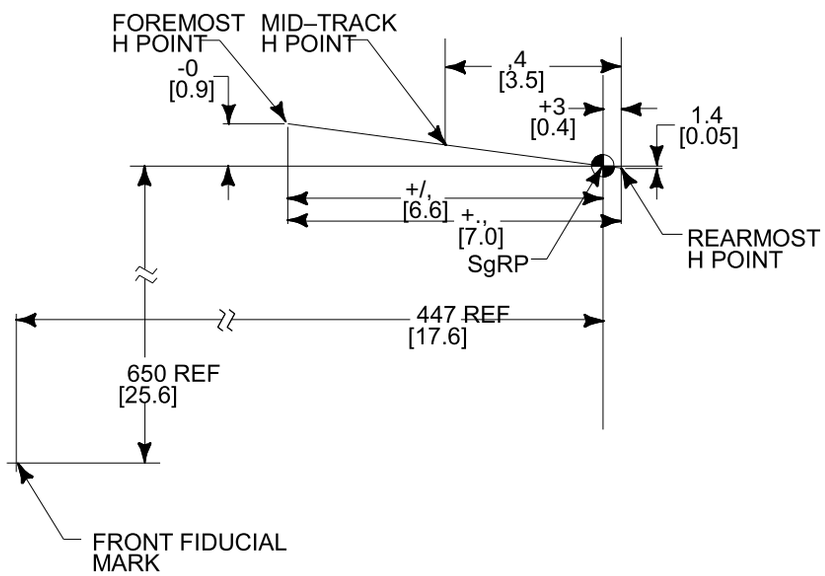
DRIVER
POWER TRACK



DRIVER
MANUAL TRACK



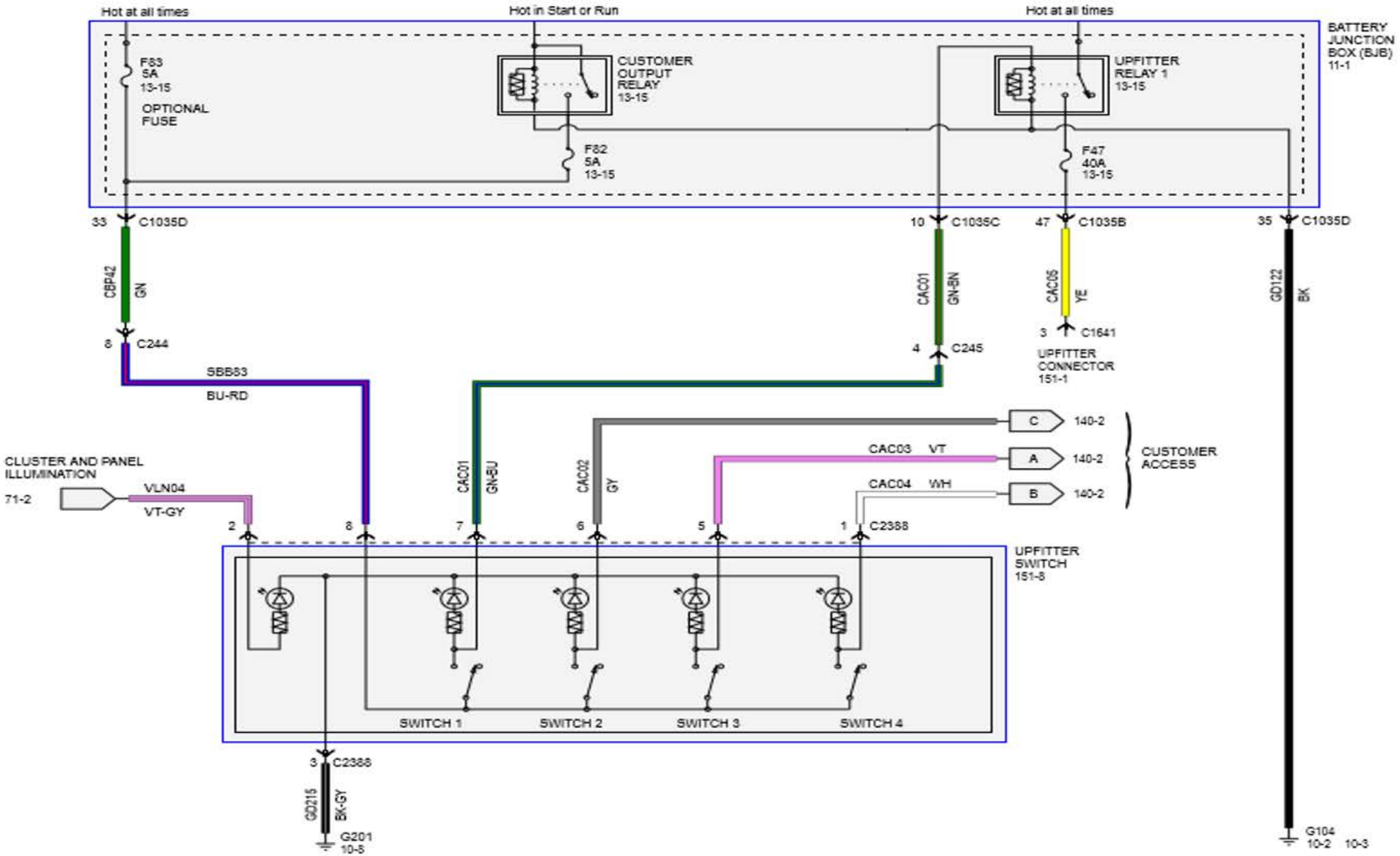
FRONT PASSENGER
MANUAL TRACK



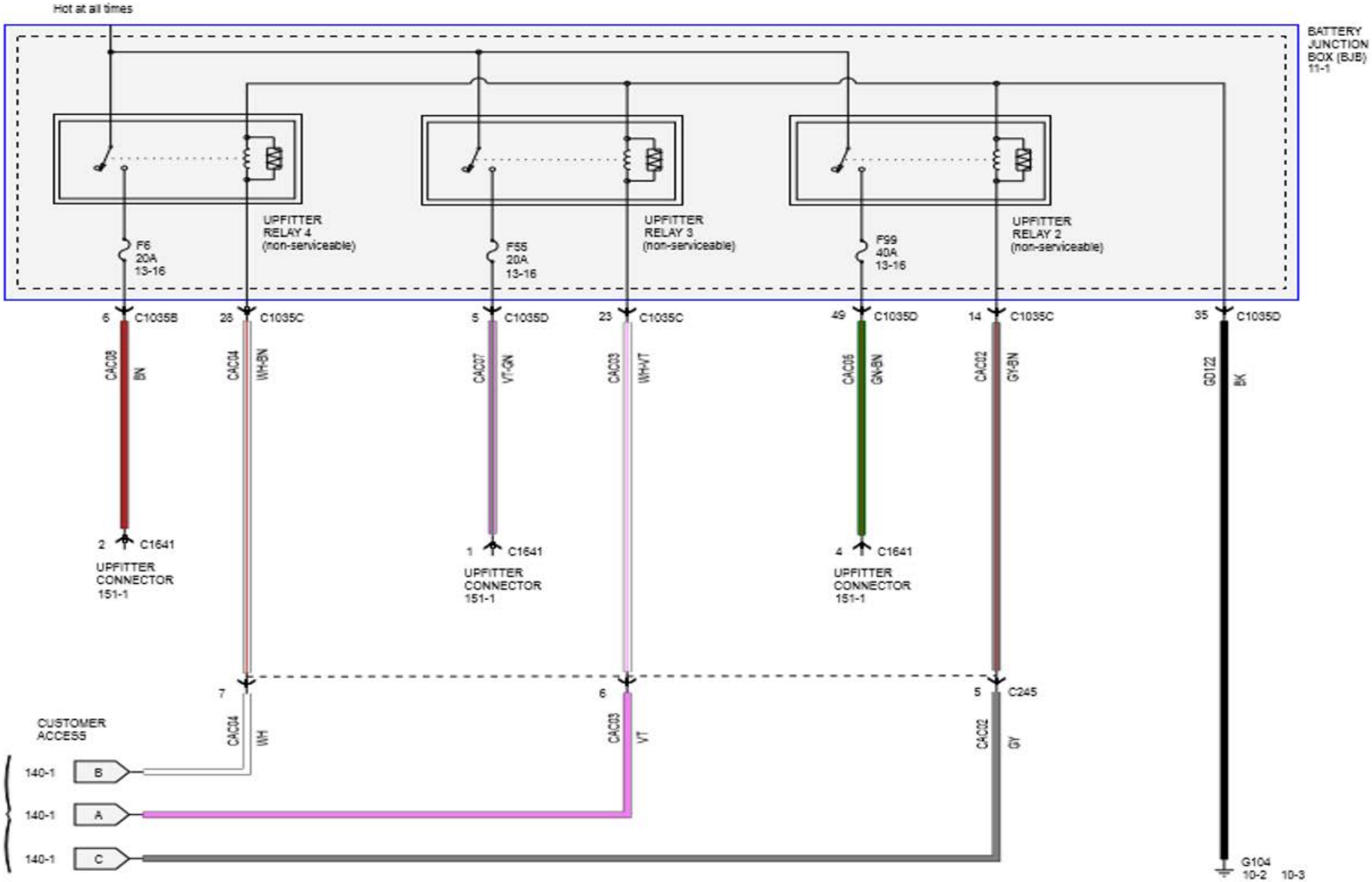
NOTES — [ ] DIMENSIONS ARE INCHES.

THIS SEAT INFORMATION IS PROVIDED TO ASSIST IN THE INSTALLATION OF SEATS OTHER THAN FORD INSTALLED SEATS AND TO HELP PRESERVE THE INTENDED PERFORMANCE OF THE SAFETY AND ERGONOMIC FEATURES OF THE E-SERIES. THE MID-TRACK H-POINT LOCATION MUST BE MAINTAINED IN ORDER TO COMPLY WITH F/CMVSS 208 AIRBAG REQUIREMENTS.

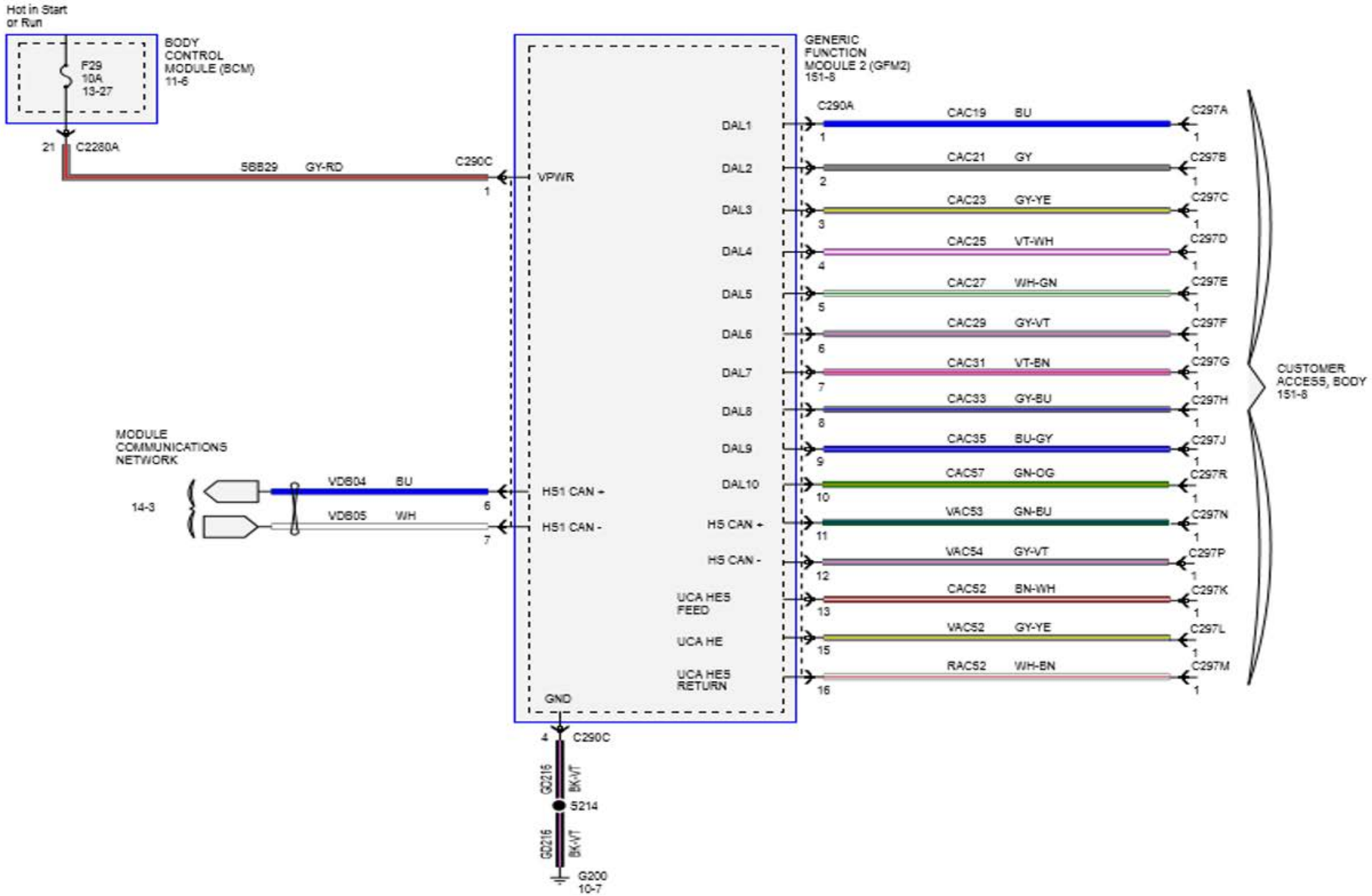
ELECTRICAL WIRING
E-SERIES CUSTOMER ACCESS CIRCUITS

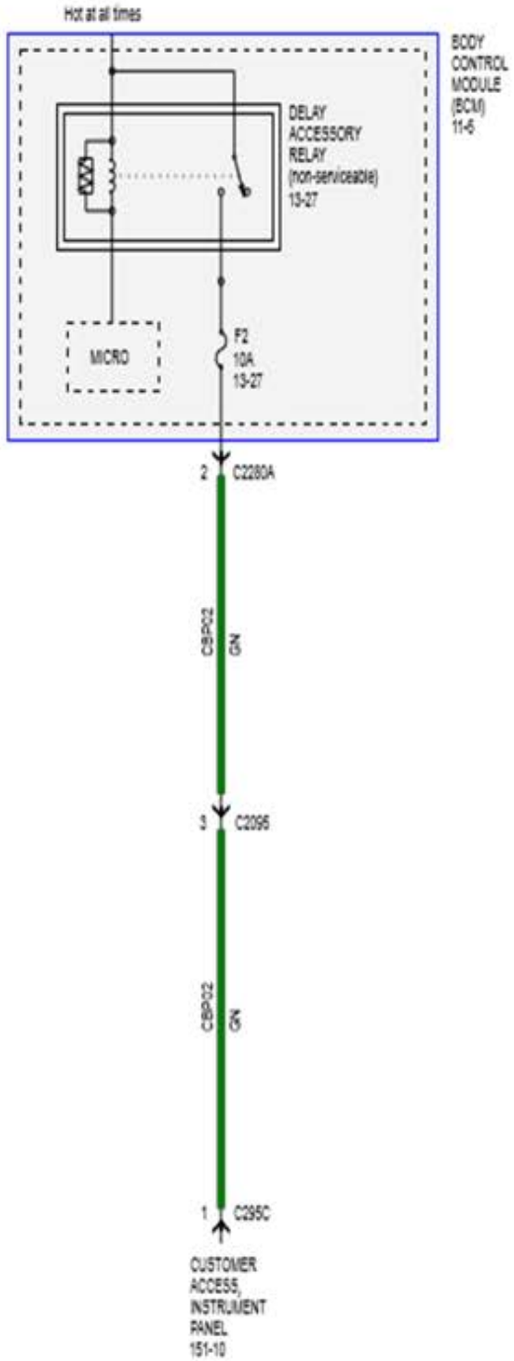


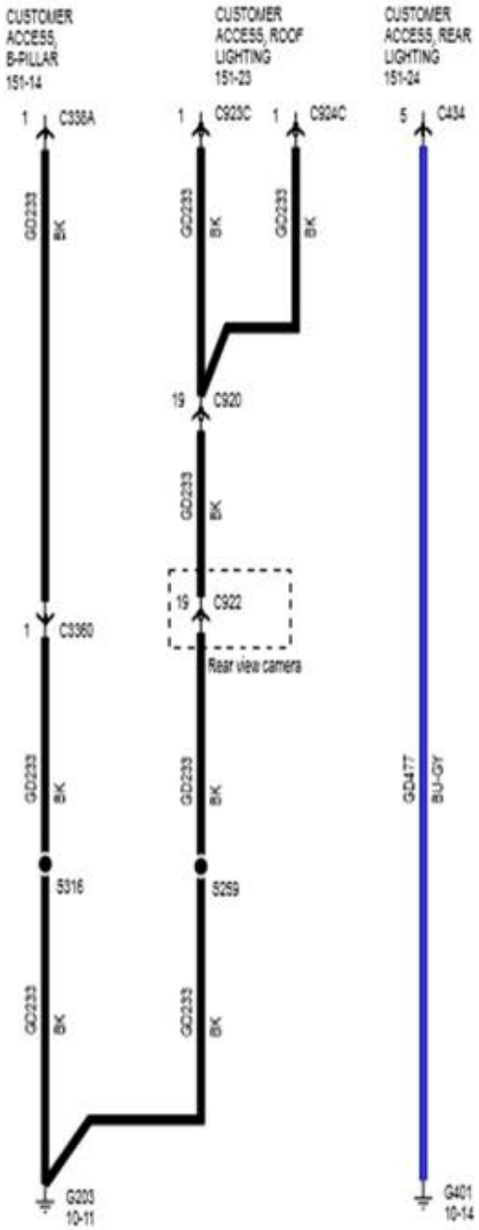
ELECTRICAL WIRING
E-SERIES CUSTOMER ACCESS CIRCUITS

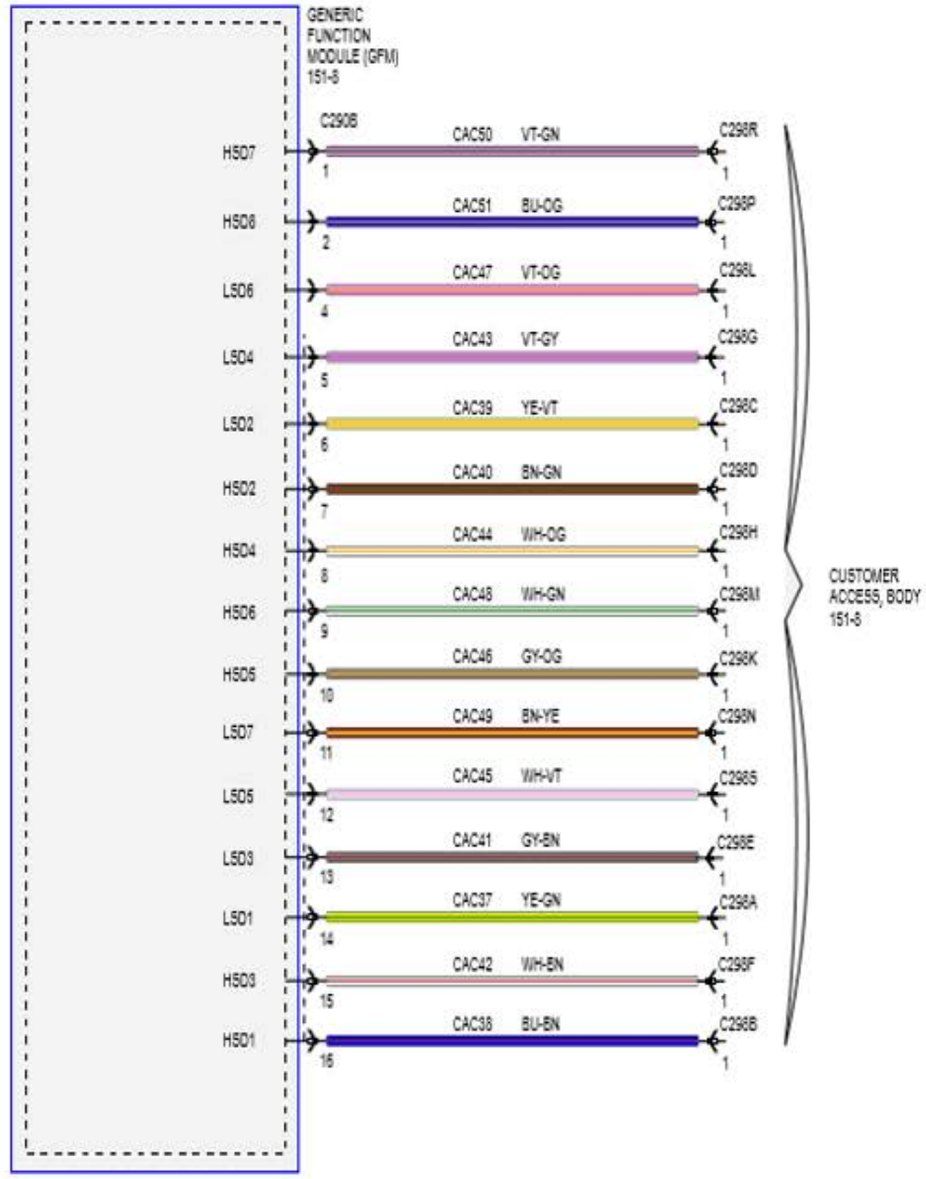


ELECTRICAL WIRING
E-SERIES CUSTOMER ACCESS CIRCUITS

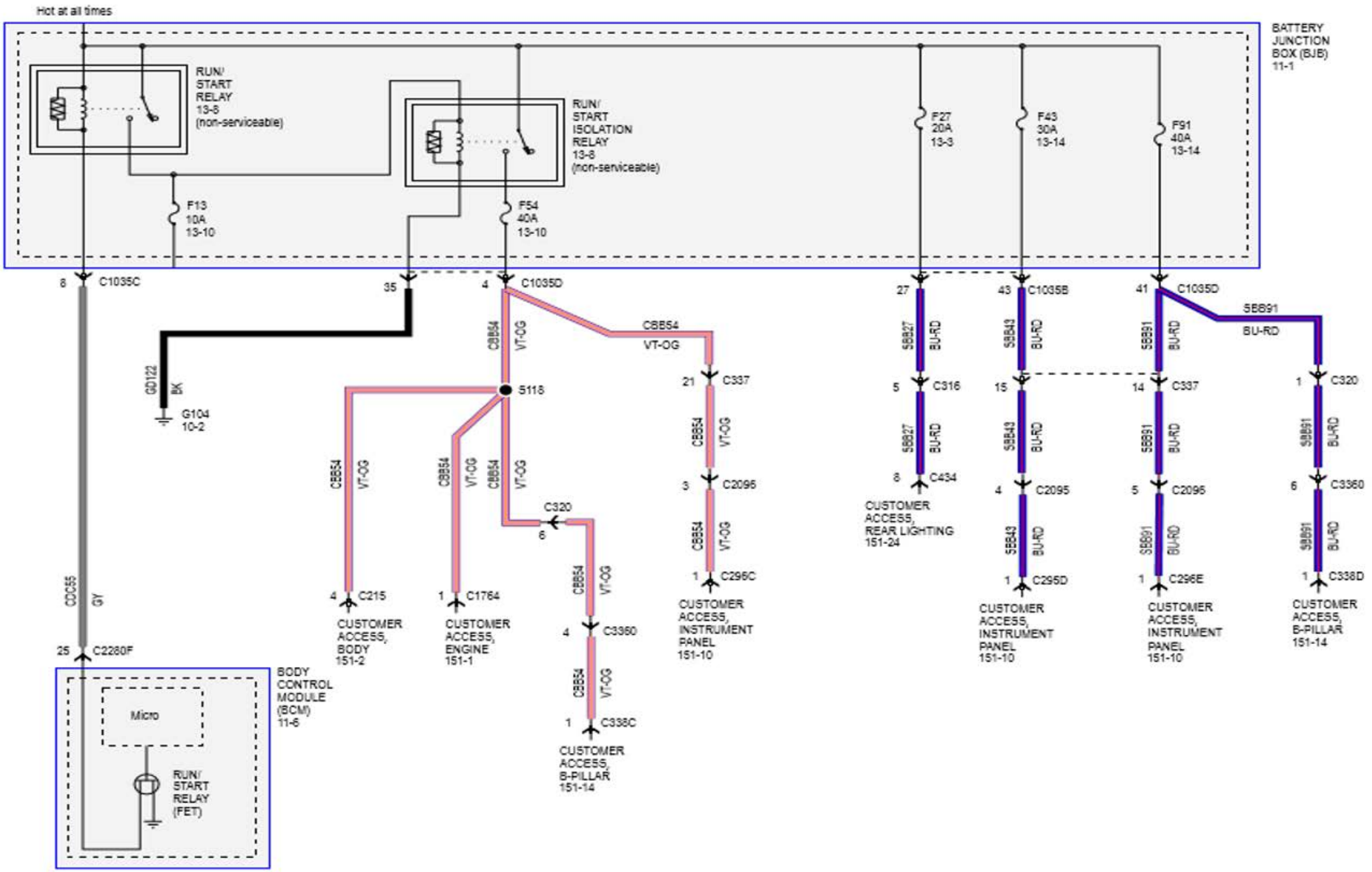


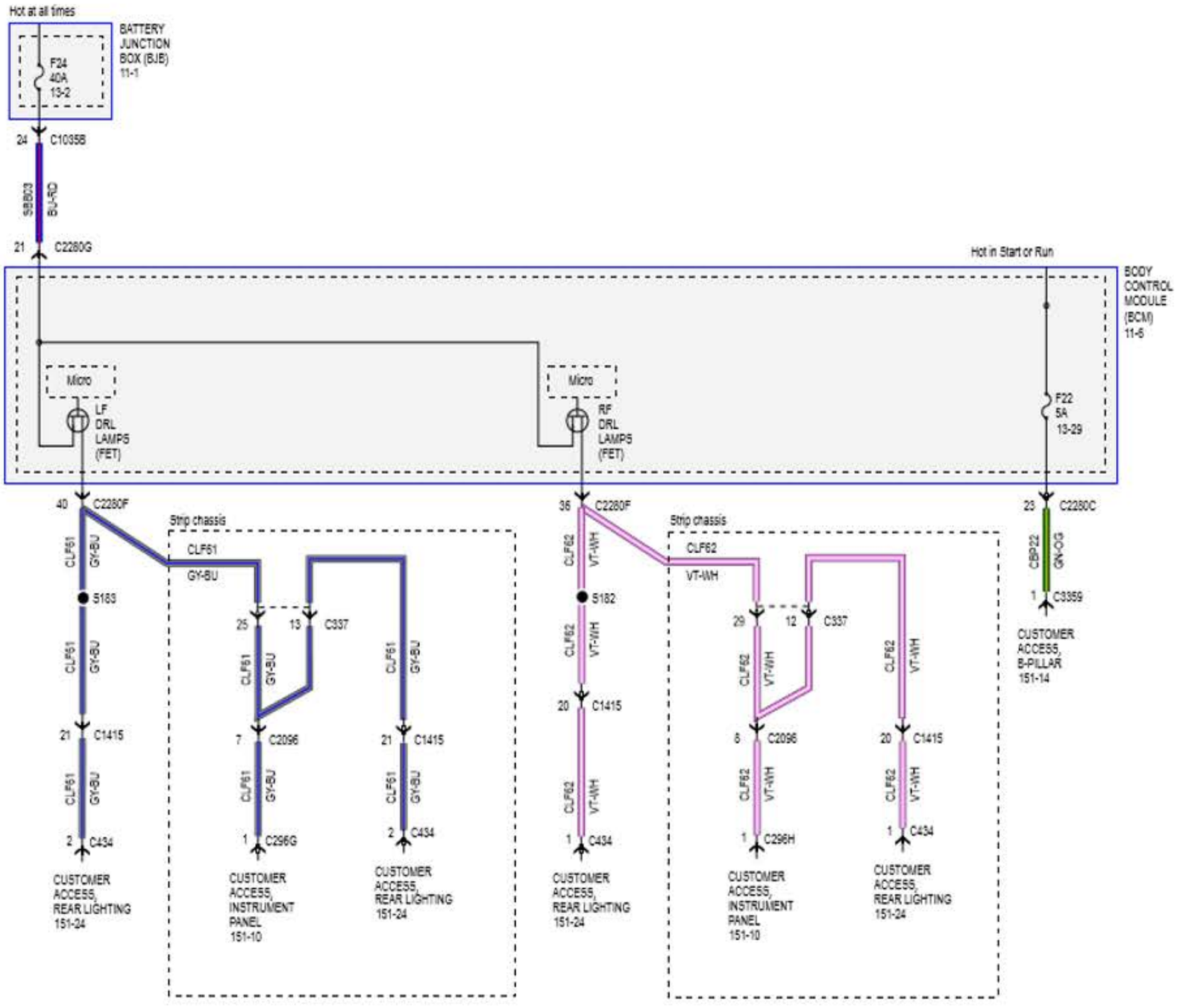

Hot at all times
BODY CONTROL MODULE (BCM) 11-6
DELAY ACCESSORY RELAY (non-serviceable) 13-27
MICRO
F2 10A 13-27
2 C2280A
CBP02 GN
3 C2096
CBP02 GN
1 C295C
CUSTOMER ACCESS, INSTRUMENT PANEL 151-10


CUSTOMER ACCESS, B-PILLAR 151-14
1 C338A
GD233 BK
1 C3360
GD233 BK
5316
GD233 BK
G203 10-11
CUSTOMER ACCESS, ROOF LIGHTING 151-23
1 C923C
GD233 BK
19 C920
GD233 BK
19 C922
Rear view camera
GD233 BK
5259
GD233 BK
1 C924C
GD233 BK
CUSTOMER ACCESS, REAR LIGHTING 151-24
5 C434
GD477 BU-GY
G401 10-14


GENERIC FUNCTION MODULE (GFM) 151-6
H5D7
H5D8
L5D6
L5D4
L5D2
H5D2
H5D4
H5D6
H5D5
L5D7
L5D5
L5D3
L5D1
H5D3
H5D1
C290B
CAC50 VT-GN C298R
CAC51 BU-OG C298P
CAC47 VT-OG C298L
CAC43 VT-GY C298G
CAC39 YE-VT C298C
CAC40 BN-GN C298D
CAC44 WH-OG C298H
CAC48 WH-GN C298M
CAC46 GY-OG C298K
CAC49 BN-YE C298N
CAC45 WH-VT C298S
CAC41 GY-BN C298E
CAC37 YE-GN C298A
CAC42 WH-BN C298F
CAC38 BU-BN C298B
CUSTOMER ACCESS, BODY 151-6

ELECTRICAL WIRING
E-SERIES CUSTOMER ACCESS CIRCUITS



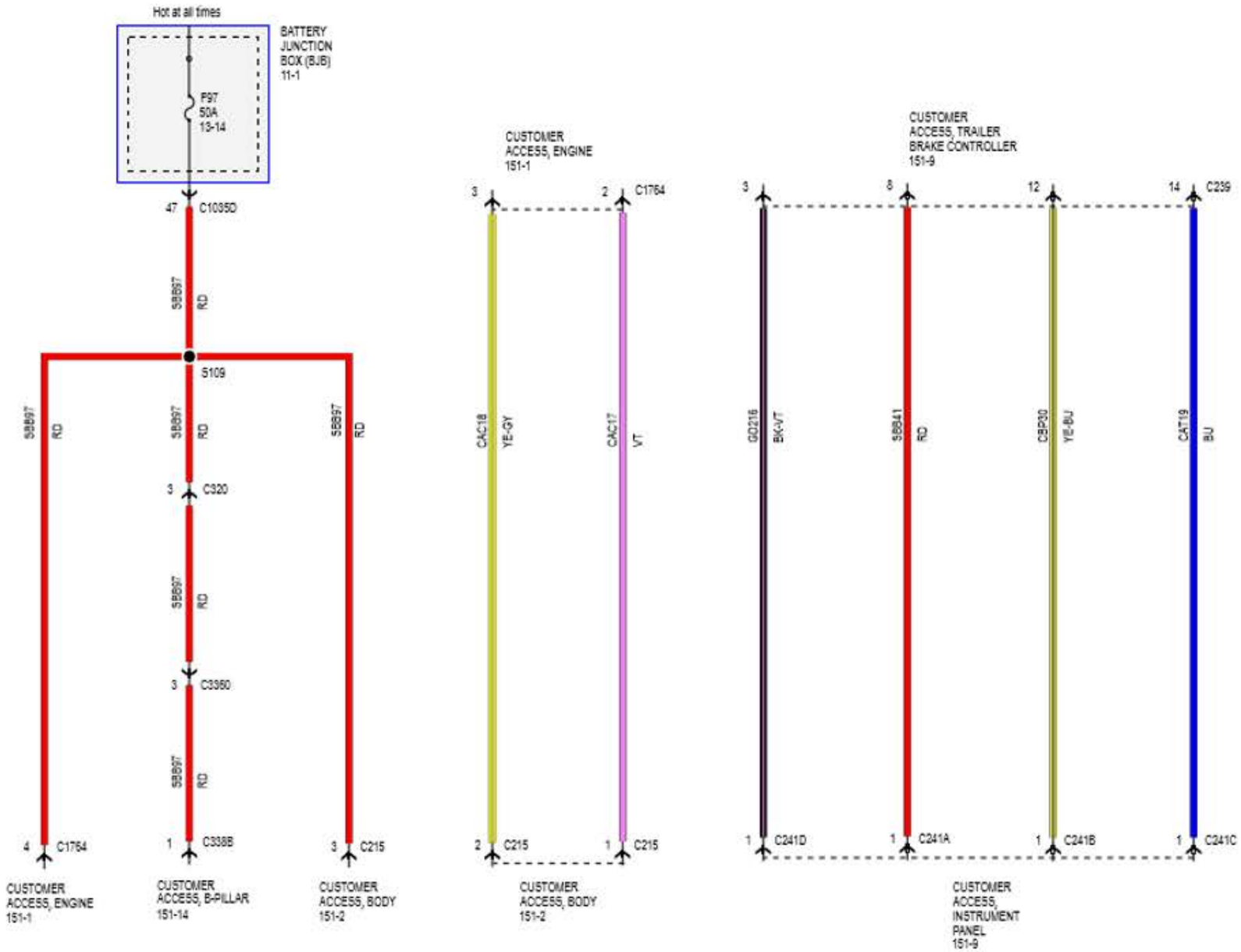


C3359

14A005

CUSTOMER ACCESS, B-PILLAR (part# N/A)

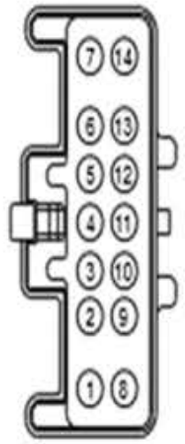
Pin	Circuit	Gauge	Circuit Function	Qualifier
1	CBP22 (GN-OG)	20	FUSE - 22 OR CIRCUIT BREAKER	
2	VME12 (BN-WH)	18	CTRL MOD. - AUDIO # SPEAKER RIGHT REAR (WOOFER) +	
3	RME12 (BN-BU)	18	CTRL MOD. - AUDIO # SPEAKER RIGHT REAR (WOOFER) -	
4	VLN33 (GY-VT)	20	CTRL MOD. - INTERIOR/COURTESY LAMP DIMMING (THEATRE)	
5	CPL36 (GN)	20	SWITCH - LATCH REAR DRIVER SIDE # AJAR (INCL SLIDING DOOR)	
6	CLN18 (GY-YE)	20	BATT SAVE/DEMAND LP	
7	-	-	Not Used	
8	RME09 (BN-YE)	18	CTRL MOD. - AUDIO # SPEAKER LEFT REAR (WOOFER) -	
9	VME09 (WH-GN)	18	CTRL MOD. - AUDIO # SPEAKER LEFT REAR (WOOFER) +	
10	CBB56 (BU-GN)	18	FUSE - 56 OR CIRCUIT BREAKER	
11	-	-	Not Used	
12	CPL13 (BN-GN)	18	CTRL MOD. - DOOR LOCK # ALL UNLOCK	
13	CPL11 (GY-BN)	18	CTRL MOD. - DOOR LOCK # ALL LOCK	
14	-	-	Not Used	
15	CLS23 (GY-OG)	20	CTRL MOD. - TURN LAMP LEFT REAR	
16	CLS27 (GN-OG)	20	CTRL MOD. - TURN LAMP RIGHT REAR	
17	-	-	Not Used	
18	-	-	Not Used	
19	-	-	Not Used	
20	-	-	Not Used	



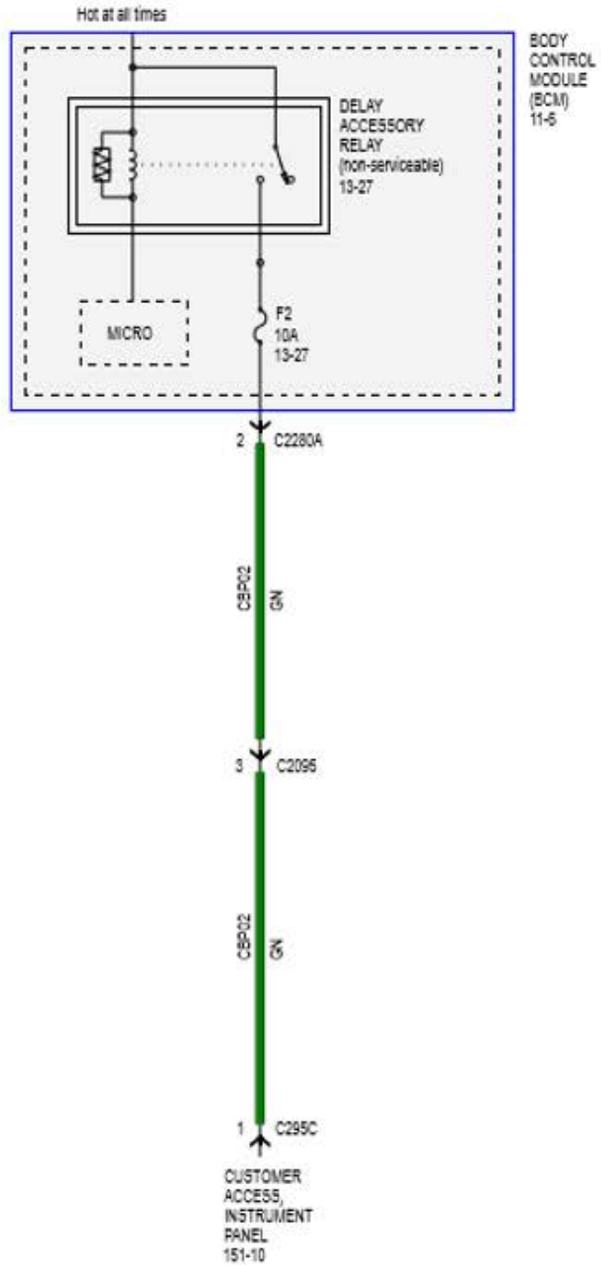
C239

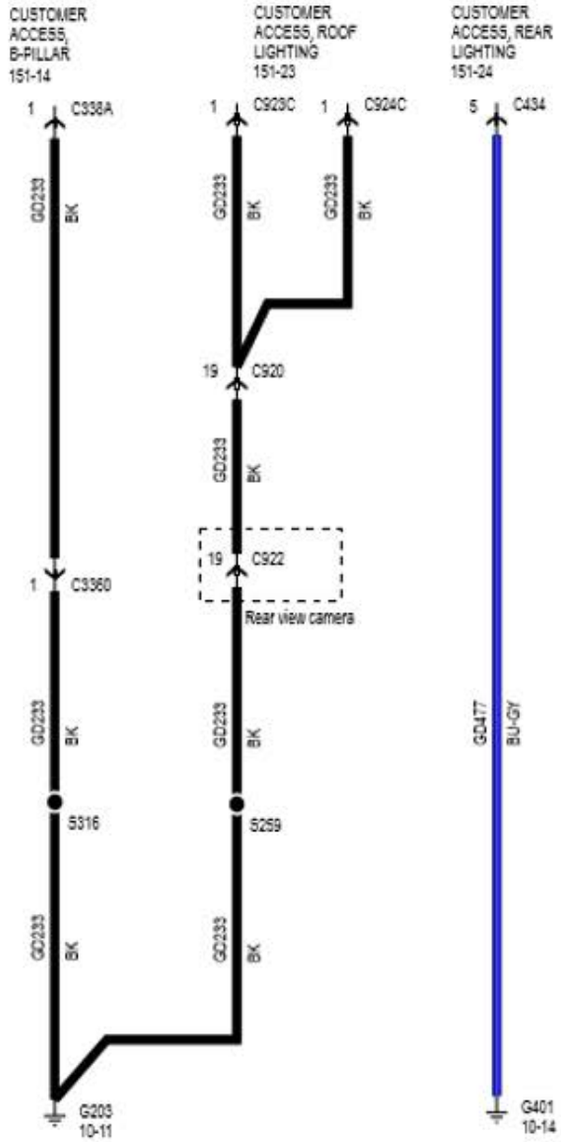
14C210

CUSTOMER ACCESS, TRAILER BRAKE CONTROLLER (part# N/A)



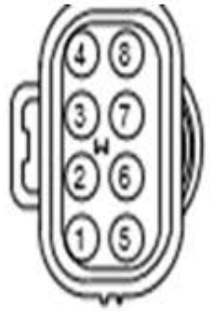
Pin	Circuit	Gauge	Circuit Function	Qualifier
1	-	-	Not Used	
2	-	-	Not Used	
3	GD216 (BK-VT)	15	GROUND - INSTRUMENT PANEL STRUCTURE # 3RD POINT	
4	-	-	Not Used	
5	-	-	Not Used	
6	-	-	Not Used	
7	-	-	Not Used	
8	SBB41 (RD)	9	FUSE - 41 OR CIRCUIT BREAKER	
9	-	-	Not Used	
10	-	-	Not Used	
11	-	-	Not Used	
12	CBP30 (YE-BU)	20	FUSE - 30 OR CIRCUIT BREAKER	
13	-	-	Not Used	
14	CAT19 (BU)	9	CTRL MOD. - TRAILER TOW # BRAKES (COLOR TO SAE 1239)	





14406

CUSTOMER ACCESS, REAR LIGHTING (part# N/A)



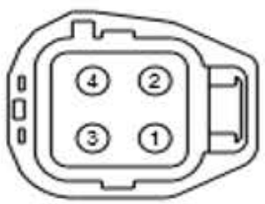
Pin	Circuit	Gauge	Circuit Function	Qualifier
1	CLF62 (GY-VT)	16	CTRL MOD. - DAYTIME RUNNING LIGHT RIGHT	
1	CLF62 (VT-WH)	16	CTRL MOD. - DAYTIME RUNNING LIGHT RIGHT	
2	CLF61 (WH-GN)	16	CTRL MOD. - DAYTIME RUNNING LIGHT LEFT	
2	CLF61 (GY-BU)	16	CTRL MOD. - DAYTIME RUNNING LIGHT LEFT	
3	CBB95 (BN-BU)	16	FUSE - 95 OR CIRCUIT BREAKER	
4	CLS10 (GN-BN)	20	CTRL MOD. - REVERSE LEFT OR COMMON	
5	GD477 (BU-GY)	9	GROUND - FRAME REAR LEFT #2	
6	CLS05 (BU-GY)	16	CTRL MOD. - PARK	
6	CLS05 (BU-GY)	18	CTRL MOD. - PARK	
7	CLN18 (GY-YE)	16	BATT SAVE/DEMAND LP	
8	SBB27 (BU-RD)	16	FUSE - 27 OR CIRCUIT BREAKER	

12A581
CUSTOMER ACCESS, ENGINE (part# N/A)

Pin	Circuit	Gauge	Circuit Function	Qualifier
1	CE140 (BN)	22	CTRL MOD. - POWERTRAIN # BATTERY CHARGE PROTECT INDICATOR (BCHPL) (BCPIL)	
2	CE326 (BU-WH)	22	CTRL MOD. - POWERTRAIN # POWER TAKE OFF OK INDICATOR (PTO_OKAY) (PTO_IND)	
3	CE912 (YE-GN)	22	SWITCH - POWER TAKE OFF REQUEST 1 (PTO) (PTORS1)	
4	CE913 (BU)	22	SWITCH - POWER TAKE OFF IDLE CONTROL 1 (PTOIC)	
5	CE926 (VT-BN)	22	SWITCH - BATTERY CHARGE PROTECT MODE (BCPSW)	
6	CE933 (BU-OG)	22	SWITCH - POWER TAKE OFF REQUEST 2 (PTORS2)	
7	CET21 (GN-OG)	22	CTRL MOD. - POWERTRAIN # TRANSMISSION RANGE OUTPUT NEUTRAL (TRO-N)	
8	CET22 (GY-BN)	22	CTRL MOD. - POWERTRAIN # TRANSMISSION RANGE OUTPUT PARK (TRO-P)	
9	LE423 (GN-VT)	22	CTRL MOD. - POWERTRAIN # VOLTAGE REFERENCE ENGINE (VREF) (E-VREF) (VREF1)	
10	RE405 (GN-WH)	22	CTRL MOD. - POWERTRAIN # SIGNAL RETURN ENGINE (E-SIGRTN) (SIGRTN-A)	
11	VE925 (GN)	22	SWITCH - POWER TAKE OFF RPM ADJUST (PTO_RPM)	
12	VMC05 (VT-OG)	22	CTRL MOD. - VEHICLE SPEED OUTPUT (VSOUT)	

C494

14406
CUSTOMER ACCESS, FRAME (part# N/A)



Pin	Circuit	Gauge	Circuit Function	Qualifier
1	CAT14 (OG)	9	RELAY - TRAILER TOW BATTERY CHARGING (COLOR TO SAE 1239)	
2	CAT03 (GY-BN)	16	CTRL MOD. - TRAILER TOW # BACKUP LAMPS	
3	-	-	Not Used	
4	CAT19 (BU)	9	CTRL MOD. - TRAILER TOW # BRAKES (COLOR TO SAE 1239)	

C239

14C210
CUSTOMER ACCESS, TRAILER BRAKE CONTROLLER (part# N/A)

Pin	Circuit	Gauge	Circuit Function	Qualifier
1	-	-	Not Used	
2	-	-	Not Used	
3	GD216 (BK-VT)	15	GROUND - INSTRUMENT PANEL STRUCTURE # 3RD POINT	
4	-	-	Not Used	
5	-	-	Not Used	
6	-	-	Not Used	
7	-	-	Not Used	
8	SBB41 (RD)	9	FUSE - 41 OR CIRCUIT BREAKER	
9	-	-	Not Used	
10	-	-	Not Used	
11	-	-	Not Used	
12	CBP30 (YE-BU)	20	FUSE - 30 OR CIRCUIT BREAKER	
13	-	-	Not Used	
14	CAT19 (BU)	9	CTRL MOD. - TRAILER TOW # BRAKES (COLOR TO SAE 1239)	

C4098

13A576
TRAILER TOW CONNECTOR (part# N/A)

Pin	Circuit	Gauge	Circuit Function	Qualifier
1	CAT09 (GN)	18	CTRL MOD. - TRAILER TOW # TURN SIGNAL RIGHT (COLOR TO SAE 1239)	
2	CAT06 (YE)	18	CTRL MOD. - TRAILER TOW # TURN SIGNAL LEFT (COLOR TO SAE 1239)	
3	CAT17 (BN)	15	RELAY - TRAILER TOW PARK LAMPS (COLOR TO SAE 1239)	
4	RAT08 (WH)	15	CTRL MOD. - TRAILER TOW # RETURN (USA ONLY, COLOR TO SAE 1239 EXCEPTION TO PSF)	

C1764

12A581
CUSTOMER ACCESS, ENGINE (part# N/A)

Pin	Circuit	Gauge	Circuit Function	Qualifier
1	CBB54 (VT-OG)	9	FUSE - 54 OR CIRCUIT BREAKER	
2	CAC17 (VT)	9	WIRE - UPFITTER CUSTOMER ACCESS #5	
3	CAC18 (YE-GY)	9	WIRE - UPFITTER CUSTOMER ACCESS #6	
4	SBB97 (RD)	5	FUSE - 97 OR CIRCUIT BREAKER	

C2300

12A581
CUSTOMER ACCESS, WIPER (part# N/A)

Pin	Circuit	Gauge	Circuit Function	Qualifier
1	CRW03 (VT-WH)	12	RELAY - FRONT WIPER	
2	CRW08 (VT-OG)	12	SWITCH - FRONT WIPER HIGH (H)	
3	CRW16 (GY-BN)	12	CTRL MOD. - FRONT WIPER LOW	
4	CRW14 (BU-WH)	18	CTRL MOD. - FRONT WASHER	
5	CRW25 (BU-GY)	12	RELAY - FRONT WIPER PARK	
6	GD122 (BK)	12	GROUND - FENDER FRONT LEFT # 3RD POINT	

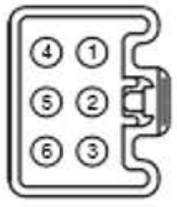
C3389

12A581
CUSTOMER ACCESS, POWER POINT/USB (part# N/A)

Pin	Circuit	Gauge	Circuit Function	Qualifier
1	CBB56 (BU-GN)	14	FUSE - 56 OR CIRCUIT BREAKER	
2	CBB12 (GN-WH)	14	FUSE - 12 OR CIRCUIT BREAKER	
3	CBB58 (GY-OG)	20	FUSE - 58 OR CIRCUIT BREAKER	
4	-	-	Not Used	

C3358

14A005
CUSTOMER ACCESS, AUXILIARY A/C (part# N/A)



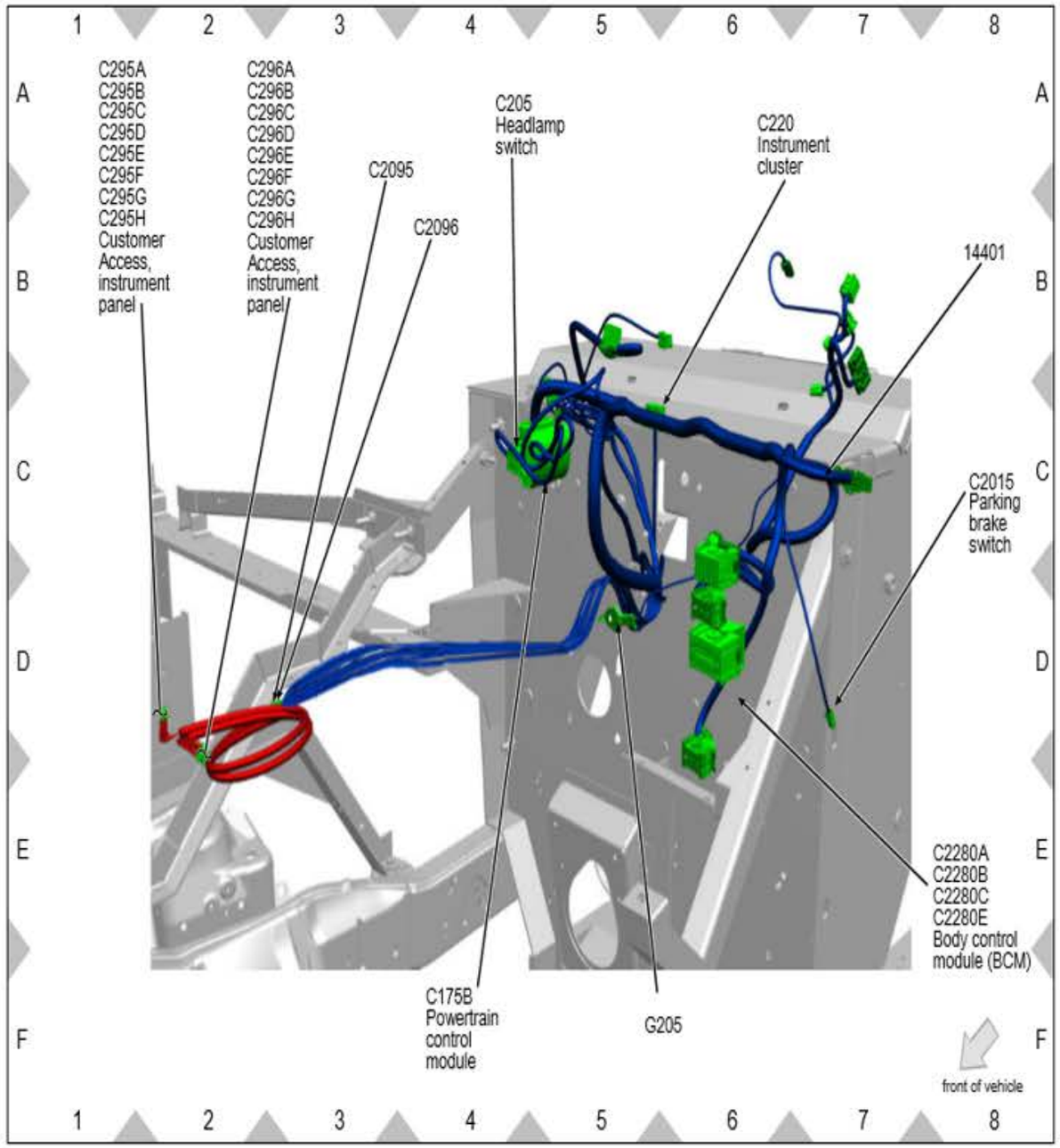
Pin	Circuit	Gauge	Circuit Function	Qualifier
1	CHA07 (BU-GY)	9	SWITCH - AUX. BLOWER # POSITION MEDIUM / MEDIUM LOW	
2	CH435 (VT-GY)	20	SWITCH - CLIMATE MODE # BLOWER	
3	GD233 (BK)	9	GROUND - COWL SIDE/PILLAR A LEFT	
4	SBB52 (GN-RD)	9	FUSE - 52 OR CIRCUIT BREAKER	
5	CHA08 (GN-OG)	20	SWITCH - AUX. BLOWER # POSITION HIGH	
6	CHA06 (YE-VT)	15	SWITCH - AUX. BLOWER # POSITION LOW	

C234

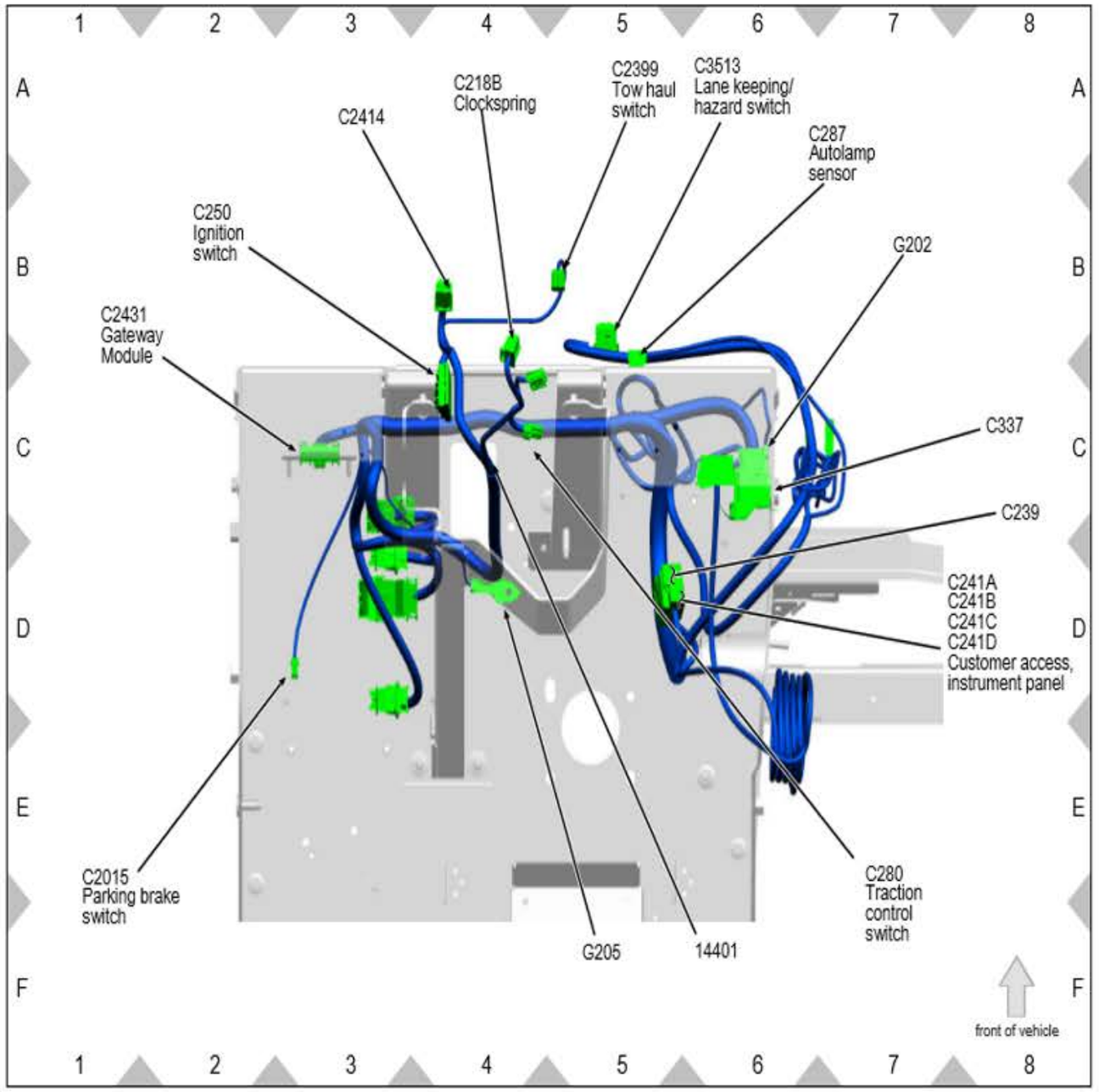
12A581
CUSTOMER ACCESS, A/C (part# N/A)

Pin	Circuit	Gauge	Circuit Function	Qualifier
1	CH302 (WH-BN)	16	CTRL MOD. - POWERTRAIN # A/C CLUTCH CONTROL RELAY / WOT AC CUTOFF (ACCR)	
2	CH434 (GY-YE)	16	SWITCH - CLIMATE MODE # AC	
3	CH421 (GY)	16	SWITCH - A/C COMPRESSOR CYCLING (ACCS)	
4	CH302 (WH-BN)	16	CTRL MOD. - POWERTRAIN # A/C CLUTCH CONTROL RELAY / WOT AC CUTOFF (ACCR)	

BEHIND DASH PANEL - STRIPPED CHASSIS

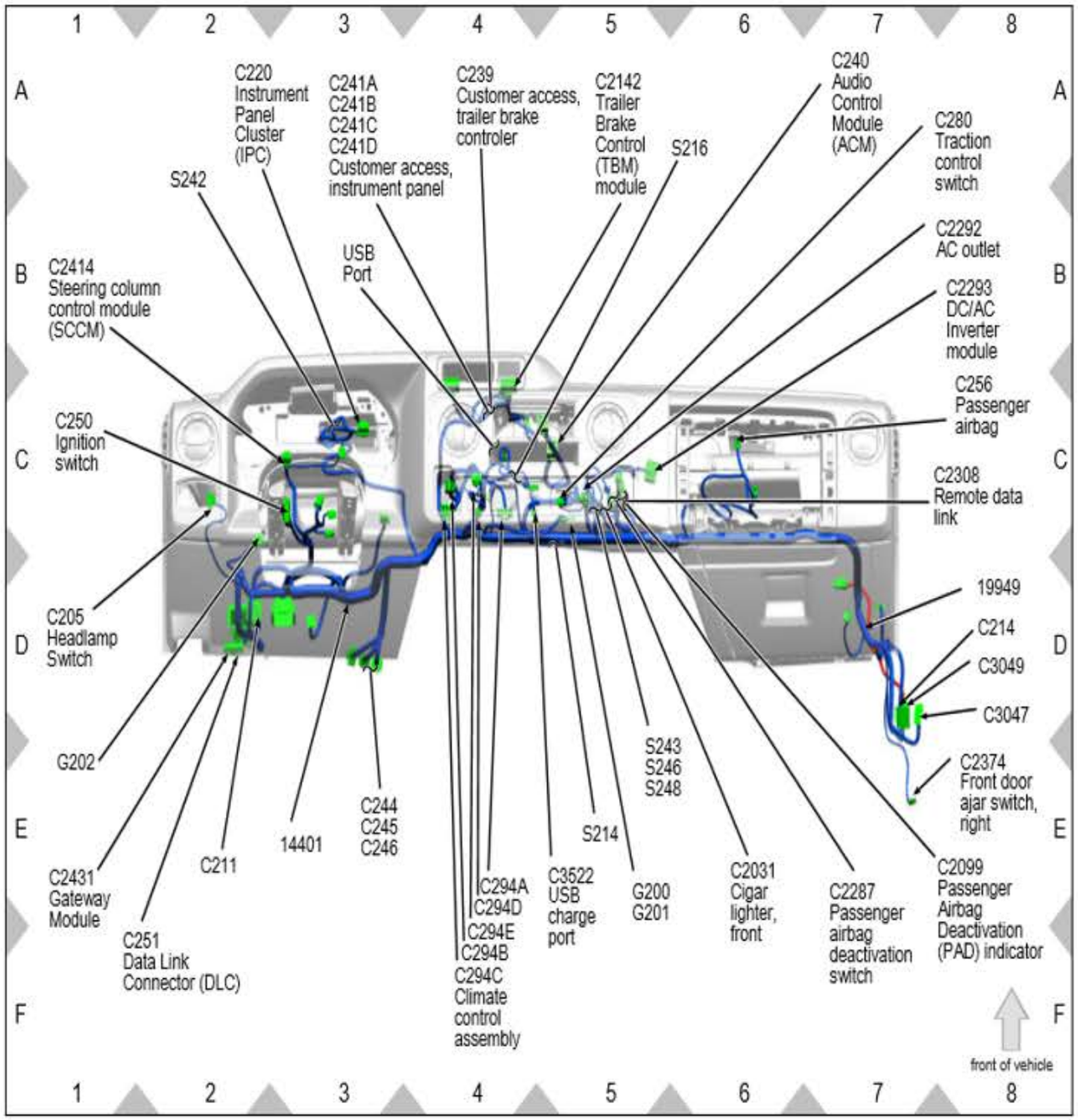


DASH PANEL - STRIPPED CHASSIS

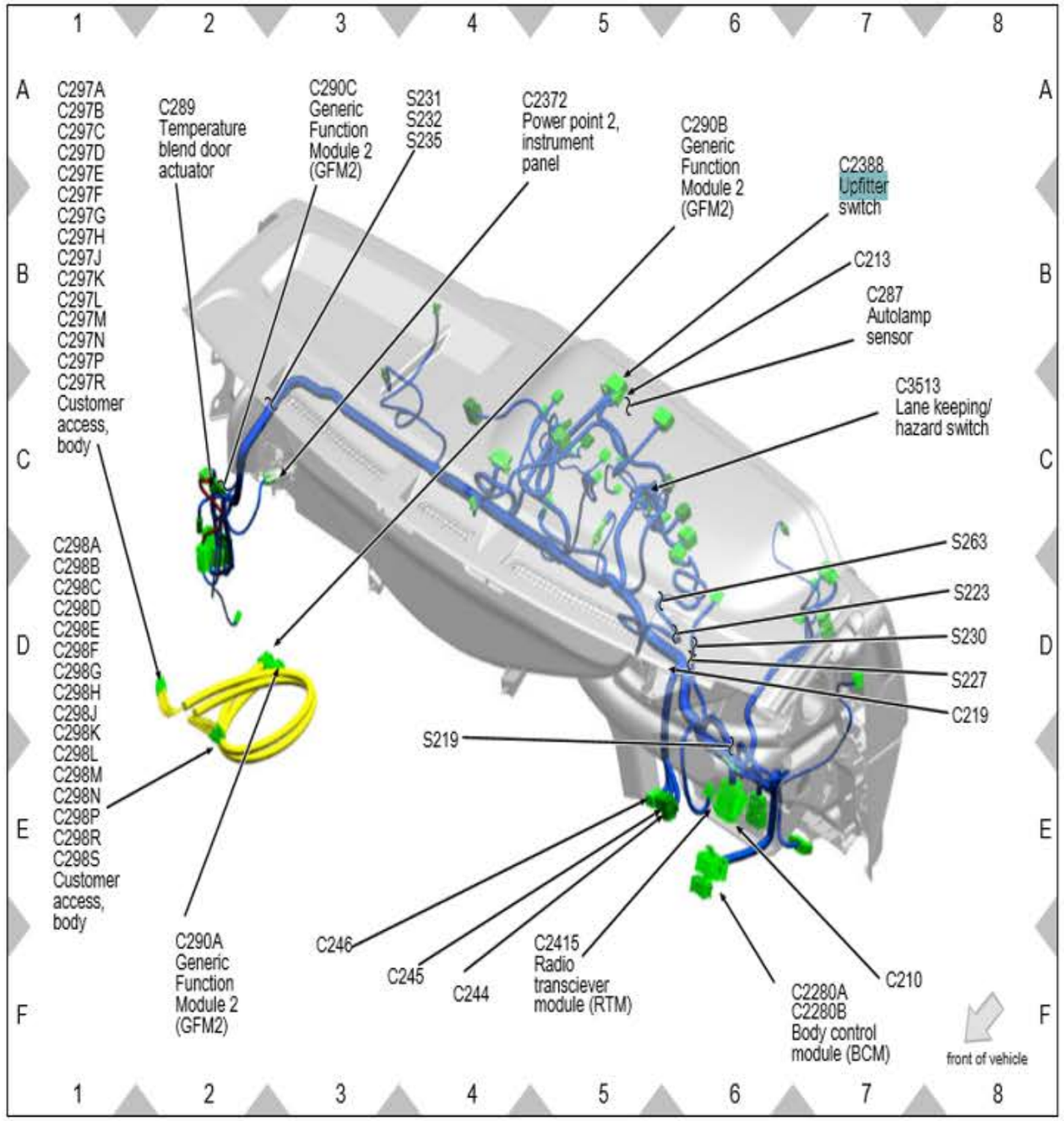


ELECTRICAL WIRING
E-SERIES WIRING CONNECTOR LOCATIONS

DASH PANEL-CUTAWAY

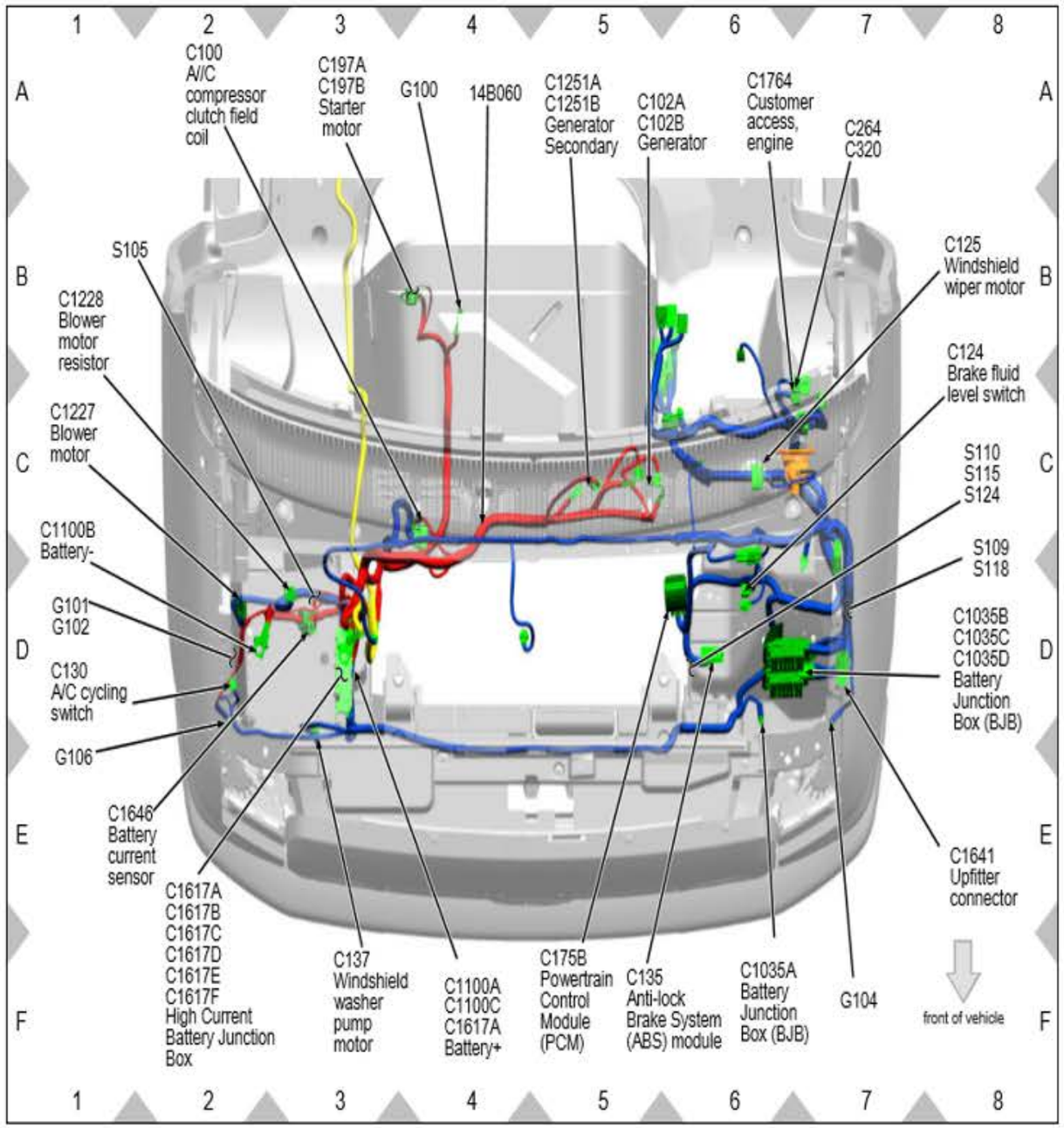


BEHIND DASH PANEL-CUTAWAY

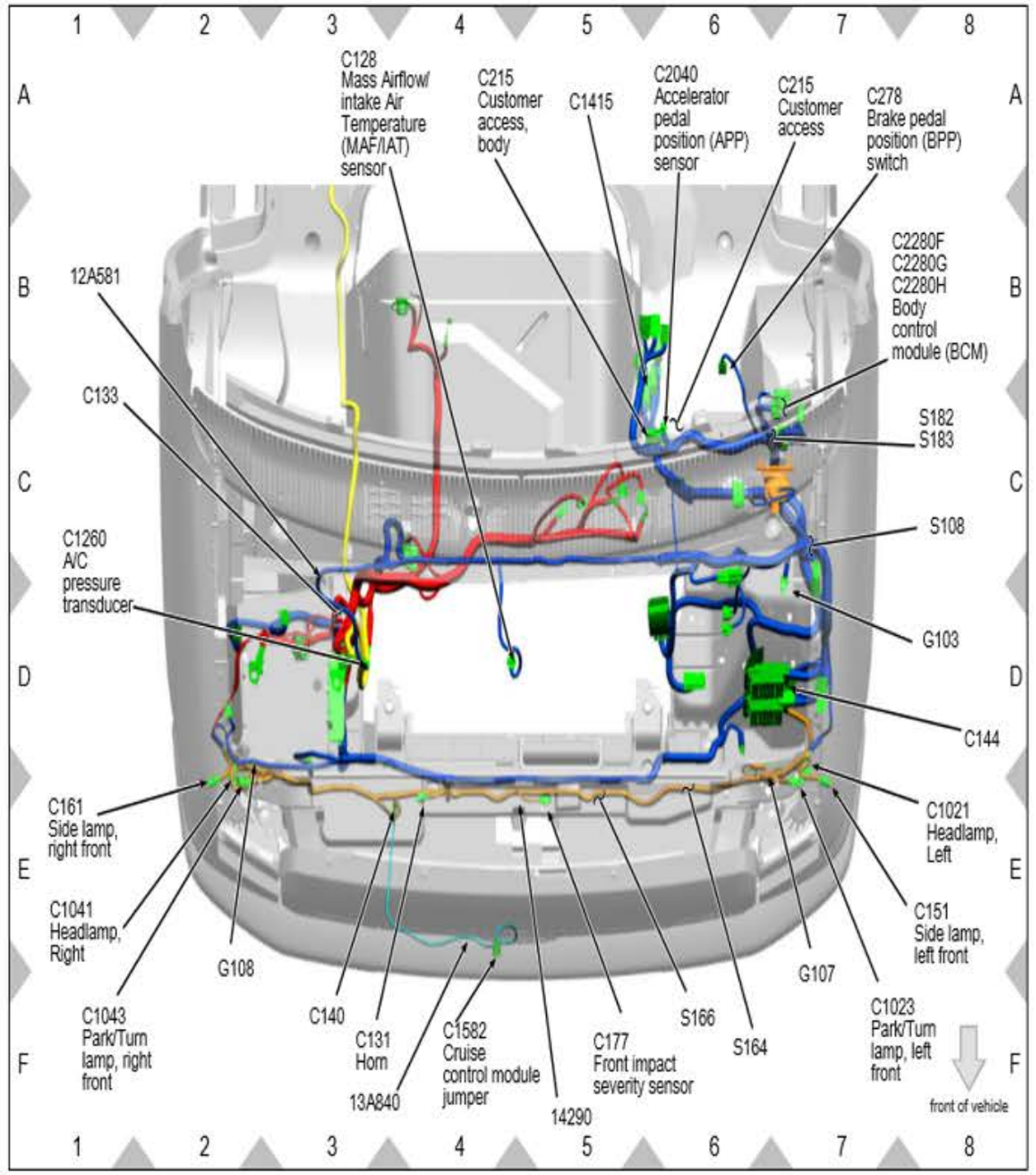

C297A C297B C297C C297D C297E C297F C297G C297H C297J C297K C297L C297M C297N C297P C297R Customer access, body
C289 Temperature blend door actuator
C290C Generic Function Module 2 (GFM2)
S231 S232 S235
C2372 Power point 2, instrument panel
C290B Generic Function Module 2 (GFM2)
C2388 Upfitter switch
C213
C287 Autolamp sensor
C3513 Lane keeping/ hazard switch
S263
S223
S230
S227
C219
S219
C298A C298B C298C C298D C298E C298F C298G C298H C298J C298K C298L C298M C298N C298P C298R C298S Customer access, body
C290A Generic Function Module 2 (GFM2)
C246
C245
C244
C2415 Radio transciever module (RTM)
C2280A C2280B Body control module (BCM)
C210
front of vehicle

ELECTRICAL WIRING
E-SERIES WIRING CONNECTOR LOCATIONS

Engine compartment - Cutaway (1 of 2)



Engine compartment- Cutaway (2 of 2)



Stationary Elevated Idle Control and Battery Charge Protect

Operating Modes

Stationary Elevated Idle Control mode

- operates in Park at elevated engine speed.

• Intended to be commanded ONLY by applying battery voltage to certain customer-access blunt-cut wire circuits, and adding a target-speed resistor, and is only available when the vehicle road speed signal is zero

• Includes a circuit which changes from open-circuit to ground when enablers are met that may be used to turn on an indicator lamp while providing battery power to an aftermarket PTO clutch or solenoid

Engine speed ramp-rates are configurable, by means of an Service tool, for all powertrains.
o Default ramp-rate for all powertrains is 200 RPM/second.
o Configurable ramp rates are as follows:
• Gas: 100 – 1000 RPM/sec (in 100 RPM/sec increments)

Typical SEIC Engagement Sequence for TorqShift™ PTO

1. 12V is applied to PTQ REQ1 circuit.
2. PCM looks for the following enabling conditions:
   - Parking brake applied.
   - Foot off of service brake
   - Vehicle in PARK (or NEUTRAL)
   - Foot off of accelerator pedal
   - Vehicle speed is 0 mph (stationary)
   - Engine at a stable base idle speed
   - Transmission Oil Temp above 20° F
   - 7.3L - Engine Coolant Temperature (ECT) 20° F minimum.

Battery Charge Protect (BCP):

-When 12V is applied to the BCP SW circuit, the engine speed goes immediately to 600. From this state, the PCM uses battery voltage as well as ambient air temp., engine oil temperature information to raise engine speed higher to maintain battery charge. Maximum engine speed in BCP mode is 1200 rpm. Loss of an operating condition after BCP is engaged will require the BCP switch to be cycled before BCP will re-engage.

• BCP CANNOT BE ACTIVE WHEN SEIC OR PTO MODES ARE ACTIVE
• A Resistor must be installed between PTO REF and PTO RPM for both Diesel and Gasoline engines.

Typical Battery Charge Protect Mode Engagement Sequence:

1. 12V applied to BCP SW circuit
2. PCM looks for the following enabling conditions:
   - Parking brake applied.
   - Foot off of service brake
   - Vehicle in PARK (or NEURTRAL)
   - Foot off of accelerator pedal
   - Vehicle speed is 0 mph (stationary)
   - Engine at a stable base idle speed
   - Transmission Oil Temp above 20° F
   - 7.3L - Engine Coolant Temperature (ECT) 20° F minimum.
3. PCM looks for a valid voltage between 0.2 to 4.7 Volts on the PTO RPM circuit
4. Vehicle idle fluctuates slightly as PCM enters BCP mode
5. The BCP LP circuit changes from open-circuit to ground. This is intended to provide a ground path for a BCP indicator lamp

NOTE: BCP is a smart system.Engine idle will not increase unless the vehicle senses an increase in electrical demand. Under periods of low electrical demand, the operator may not notice any change in engine RPM.It is recommend that the modifier install an indicator lamp to alert the operator that BCP is properly engaged.

Additional notes:

Adaptive Cooling

This PCM strategy automatically restricts engine power when it senses an over-temperature condition, and may interrupt the SEIC-PTO operation. Typically, the over-temperature condition it reacts to will also show up on the temperature gage on the instrument panel. Elevated engine speed, typical of SEIC operation, may help avoid Adaptive Cooling occurrence due to the resultant additional engine and transmission coolant flow. However, depending on the auxiliary PTO power being demanded, 900 rpm may not be enough to prevent the power train from entering Adaptive Cooling mode, but 1500 rpm may.

Input Resistor

ALL modes (SEIC, PTO) require usage of an input resistor. The resistor value may be obtained in Tables A & B.

7.3L Gasoline SEIC / BCP

Vehicle Conditions to Enable SEIC (all are required)	Vehicle Conditions that Disable SEIC (any one required - See Note-1)	SEIC	BCP
Parking brake applied.	Parking brake disengaged.	Yes	Yes
Foot off of service brake	Depressing service brake	Yes	Yes
Vehicle in PARK (or NEUTRAL)	Vehicle take out of PARK (or NEUTRAL)	Yes	Yes
Foot off of accelerator pedal	Accelerator pedal depressed	Yes	Yes
Vehicle speed is 0 mph (stationary)	Vehicle speed is not 0 mph (stationary)	Yes	Yes
Engine at a stable base idle speed		Yes	Yes
Transmission Oil Temp above 20°F	Transmission Oil Temperature (TOT) exceeds 240°F.	Yes	Yes
Engine Coolant Temperature (ECT) 20° F minimum (6.7L)	Engine Coolant Temperature (ECT) exceeds 230° F	Yes	No
Engine Coolant Temperature (ECT) 20 degree F minimum. (7.3L)	Engine Coolant Temperature Limit (ECT) 230 degree F maximum	Yes	Yes
	Catalyst Temperature Limit	Yes	Yes

Note 1: A “change-of-state” at the “PTO REQ1” input (for Stationary Elevated Idle Control non-Split Shaft), or for both “PTO REQ1 and PTO REQ2” inputs (for Stationary Elevated Idle Control Split Shaft) is required to re-invoke Stationary Elevated Idle Control. When a disable is seen by the PCM, the Stationary Elevated Idle Control function is de-activated, the “PTO RELAY” output circuit changes from a “ground-source” to “open-circuit”, and engine speed returns to base idle. To re-activate Stationary Elevated Idle Control, the operator must open the PTO Switch to the “PTO REQ1” and “PTO REQ2” inputs, then close the PTO Switch again to the “PTO REQ1” or “PTO REQ1 and PTO REQ2” inputs.

Note 2: A “change-of-state” at the “BCP SW” input is required to re-invoke Battery Charge Protect. When a disable is seen by the PCM, the Battery Charge Protect function is de-activated, the “BCP LP’ output circuit changes from a “ground-source” to “open-circuit”, and engine speed returns to base idle. To re-activate Battery Charge Protect, the operator must open the Battery Charge Protect Switch to the “BCP SW” input, then close the Battery Charge Protect Switch again to the “BCP SW” input.

Note 3: See Split-Shaft Mode Description

E-Series – 7.3L Gasoline Engine PCM				
Wire Color	**Wire Tag**	**Circuit No.**	**Circuit Int ent**	**Descript ion**
Yellow / Green	PTOREQ1	CE912	INPUT(VPWR)	**PCM Pin** •Applying vehicle battery voltage to this wire initiates SEIC **Stationary Mode** process. •Signals TorqShift™ transmission to enter SEIC Stationary Mode strategy. •Verifies safety enablers. •Turns off OBD and other emission-related monitoring. •Elevates engine speed to target found at PTO-RPM circuit. •Invokes the PTO relay circuit when safety enablers are met. •Looks for the target engine speed requested at the PTO_RPM circuit using a resistor or POT
Blue / Orange	PTOREQ2	CE933	INPUT(VPWR)	**PCM Pin** •Applying vehicle battery voltage to this wire initiates **Mobile PTO Mode.** . •Signals TorqShift™ transmission to enter Mobile mode strategy. •Verifies safety enablers. •Turns off OBD and other emission-related monitoring. •Invokes the PTO relay circuit when safety enablers are met. •Requires valid resistance on PTO_RPM input for system to function
Blue / Whit e	PTORLY	CE326	OUTPUT	**PCM Pin** •A low-side driver, changing from "open-circuit" to "ground" indicating that the engine is ready for PTO operation to begin and that a PTO load may be applied. •Intended for powering a PTO indicator lamp, or turn on a relay coil (not to exceed 1amp).LED lights require adding a resistor in series.
Green	PTO RPM	CE925	INPUT(resistor)	**PCM Pin** •Requires the addition of a resistor or potentiometer for any SEIC / PTO mode. •Resistor / potentiometer selection determines the fixed or variable engine target speed. •Combine in circuit with PTO_VREF (+5VDC). •Speed range available: 910 rpm to 2400 rpm
Green / Violet	PTO VREF	LE423	Reference Volt age	**PCM Pin** •A +5-volt reference, buffered against shorts to ground or power, used to complete the resistor circuit for engine speed selection.
Green / White	SIGRTN_A	RE405	PCM Ground	**PCM Pin** •A ground reference, buffered, used to complete the resistor circuit for engine speed selection.
Violet / Brown	BCP SW	CE926	INPUT(VPWR)	**PCM Pin** •Applying vehicle battery voltage to this wire begins BCP. •BCP regulates engine speed between 600 to 1200 rpm to maintain required charge system voltage
Brown	BCPIL	CE140	OUTPUT	**PCM Pin** •A low-side driver, changing from "open-circuit" to "ground" indicating that BCP is in effect. •Intended for powering an LED lamp (40mA max.).

E-Series – 7.3L Gasoline Engine CUSTOMER ACCESS SIGNAL CIRCUITS -.

Wire Color	Wire Tag	Circuit No.	Circuit Intent	Description
Gray / Brown	TRO P	CET22	OUTPUT PARK-Only	- An output from the PCM that indicates when the Transmission Range Sensor is indicating that the Transmission is in the Park Position. The Low Side driver (160mA max.) in the PCM will pull this output to ground when active (Transmission is in the PARK Position). To properly reference this output, the customer supplied external controller/device needs to pull this output up to VPWR with a 680 Ohm resistor. Thus when the output is active, the voltage at this output will be 0 volts. When this output is not active, the output will be pulled up to VPWR by the 680 Ohm pull up resistor.E47
Green / Orange	TRO N	CET21	OUTPUT NEUTRAL-Only	- An output from the PCM that indicates when the Transmission Range Sensor is indicating that the Transmission is in the Neutral Position. The Low Side driver (160mA max.) in the PCM will pull this output to ground when active (Transmission is in the Neutral Position). To properly reference this output, the customer supplied external controller/device needs to pull this output up to VPWR with a 680 Ohm resistor.Thus when the output is active, the voltage at this output will be 0 volts. When this output is not active, the output will be 'pulled up to VPWR by the 680 Ohm pull up resistor.
Violet / Orange	VS OUT	VMC05	OUTPUT Vehicle Speed	- An output from the PCM that provides 8000 pulses per mile signal with a 50% duty cycle. The low side driver in the PCM will switch the output off and on (off will allow the output to be pulled up close to VPWR), (on will put the output to 0 volts).
Blue	CTO	CE913	OUTPUT Engine Speed	- An output from the PCM that indicates a Clean Tachometer Output to provide an indication of engine RPM. The low side driver in the PCM will switch the output off and on (off will allow the output to be pulled up close to VPWR), (on will put the output to 0 volts), at a Frequency = ((Engine RPM's * Number of cylinders) / 120), with a duty cycle of 50%. The customer-supplied external controller should have a high-impedance input such that it does not impact the PCM's ability to provide a Clean Tach Out signal.
White / Violet	PARK BRAKE	CMC25	OUTPUT Park Brake	- Ground Output Signal wire NOTE: The Body Control Module (BCM) park brake input also uses this signal. The BCM park brake input cannot source any current. The body builder must provide a high impedance circuit (such as a Field Effect Transistor) with a 20 kilo-ohm or larger resistor to prevent faulting the Body Control Module. See schematic in the Body Builder Layout Book.

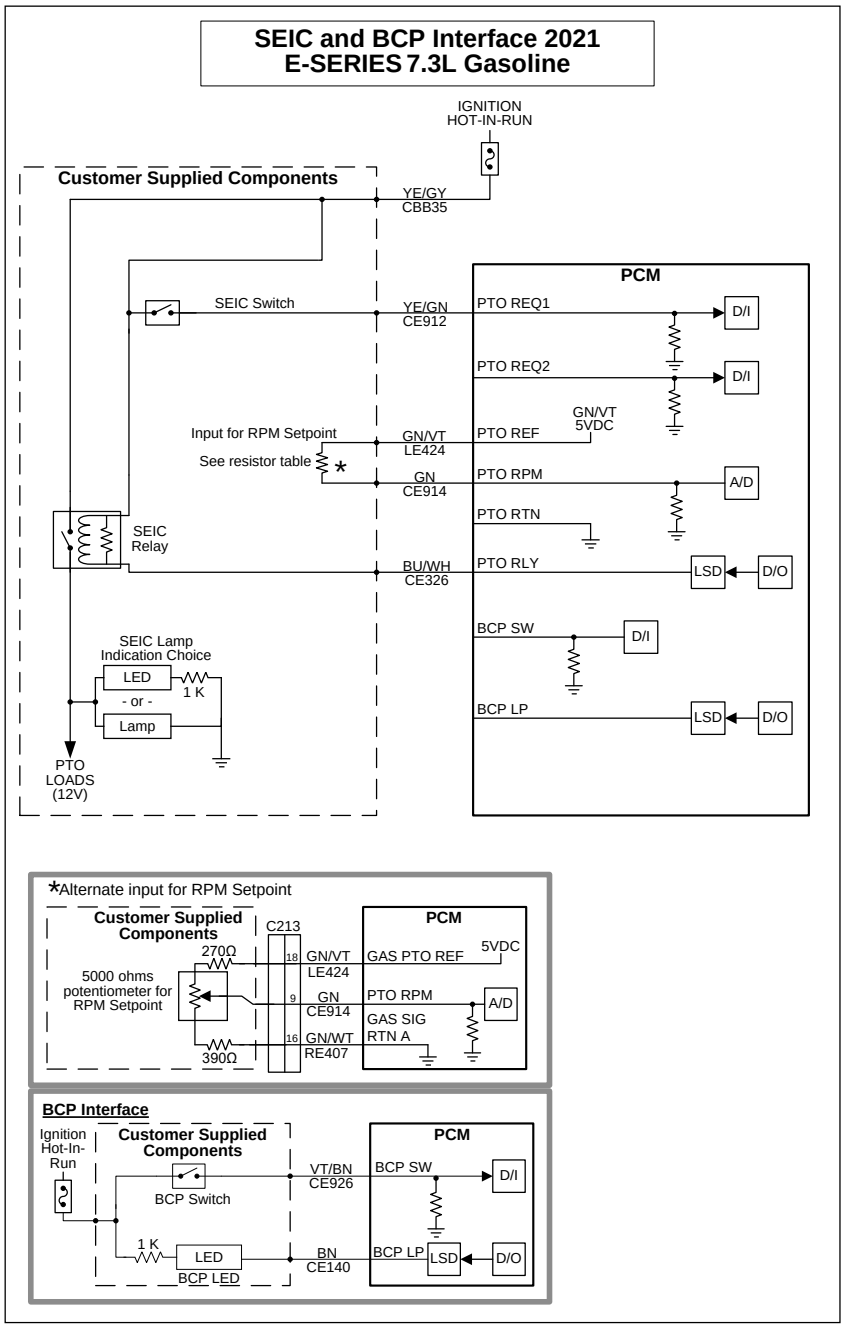
Gas Resistor Chart (0.1 Volt resistor chart)

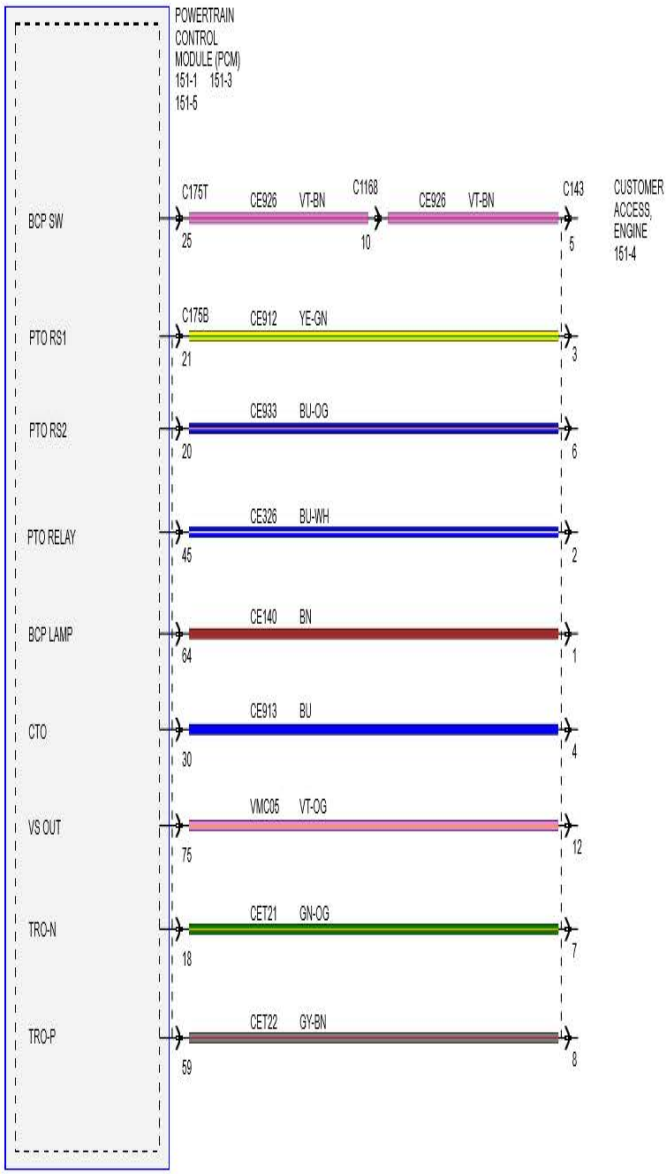
GAS RESISTOR CHART	PTO_RPM Input Voltage	Resistor	GAS SEIC PTO Engine RPM
voltage out of range low	0.00	n/a	n/a
	0.10	n/a	n/a
	0.20	n/a	n/a
voltage dead band	0.30	73633	700
Usable voltage range	0.40	54050	700
	0.50	42300	743
	0.60	34467	785
	0.70	28871	828
	0.80	24675	870
	0.90	21411	913
	1.00	18800	955
	1.10	16664	998
	1.20	14883	1040
	1.30	13377	1083
	1.40	12086	1125
	1.50	10967	1168
	1.60	9988	1210
	1.70	9124	1253
	1.80	8356	1295
	1.90	7668	1338
	2.00	7050	1380
	2.10	6490	1423
	2.20	5982	1465
	2.30	5517	1508
	2.40	5092	1550
	2.50	4700	1593
	2.60	4338	1635
	2.70	4004	1678
	2.80	3693	1720
	2.90	3403	1763
	3.00	3133	1805
	3.10	2881	1848
	3.20	2644	1890
	3.30	2421	1933
	3.40	2212	1975
	3.50	2014	2018
	3.60	1828	2060
	3.70	1651	2103
	3.80	1484	2145
	3.90	1326	2188
	4.00	1175	2230
	4.10	1032	2273
	4.20	895	2315
	4.30	765	2358
	4.40	641	2400
voltage dead band	4.50	522	2400
	4.60	409	2400
Voltage out of range high	4.70	n/a	n/a
	4.80	n/a	n/a
	4.90	n/a	n/a
	5.00	n/a	n/a

Gas Resistor Chart (100 Rpm Resistor chart)

7.3L GAS Stationary		
Engine Target	Resistor	Voltage
700	54050	0.40
800	32291	0.64
900	22293	0.87
1000	16550	1.11
1100	12822	1.34
1200	10207	1.58
1300	8271	1.81
1400	6780	2.05
1500	5596	2.28
1600	4634	2.52
1700	3836	2.75
1800	3164	2.99
1900	2590	3.22
2000	2094	3.46
2100	1661	3.69
2200	1281	3.93
2300	943	4.16
2400	641	4.40

SEIC AND BCP INTERFACE



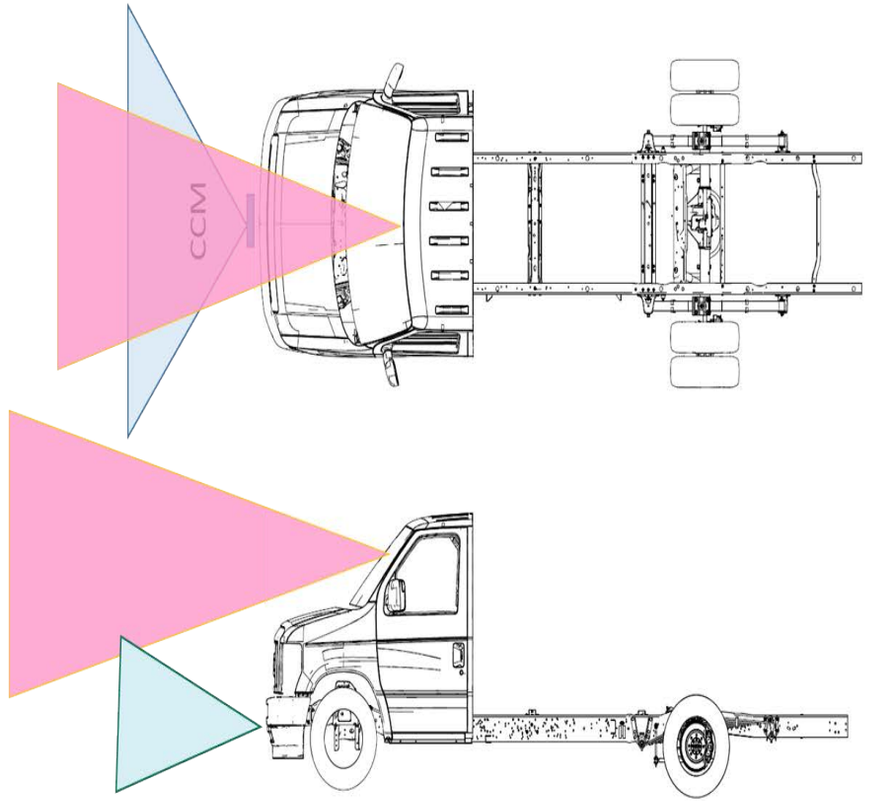


E-SERIES
ADAS Field of View

- NOT RECOMMEND RELOCATING CAMERA OR RADAR
- ADAS HARDWARE CANNOT BE ADDED TO VEHICLE POST PRODUCTION.
- VERIFY LOCATION WHEN USING AFTERMARKET HOOD MOUNTED MIRRORS WHICH COULD POSSIBLY INTERFERE WITH CAMERA "FIELD OF VIEW"
- NOT RECOMMEND EQUIPPING VEHICLES WITH WINCH SYSTEMS, CONES, CABLES, LICENSE PLATES (CENTER) WHICH COULD POSSIBLY OBSTRUCT/INTERFERE WITH RADAR AND CAMERA "FIELD OF VIEW"
- NOT RECOMMEND APPLYING PAINT OR DECALS TO RADAR OR COVER WHICH COULD POSSIBLY OBSTRUCT/INTERFERE RADAR FIELD OF VIEW
- NOT RECOMMEND APPLYING DECALS OR OBJECTS TO THE FRONT OF WINDSHIELD WHICH COULD POSSIBLY OBSTRUCT/INTERFERE CAMERA "FIELD OF VIEW." OVER ROOF SYSTEMS THAT EXTEND FORWARD OF WINDSHIELD ENSURE THAT IT DOES NOT INTERFERE WITH CAMERA "FIELD OF VIEW".
- NOT RECOMMEND USING AFTERMARKET SUSPENSION COMPONENTS (E.G. ADDING AIR RIDE, HELPER SPRINGS, LIFT KITS, ETC.) WHICH COULD POSSIBLY OBSTRUCT/INTERFERE RADAR AND CAMERA FIELD OF VIEW ZONES
- NOT RECOMMEND USING FRONT BUMPER SYSTEM TO PUSH OTHER OBJECTS/VEHICLES THIS IS TO PREVENT ANY DAMAGE OR MISALIGNMENT TO RADAR AND COVER.
- NOT RECOMMEND MODIFYING OR REPLACING FACTORY EQUIPPED BUMPER WITH AFTERMARKET SOURCED BUMPERS WHICH MAY INTERFERE WITH RADAR "FIELD OF VIEW".
- IF THE CAMERA OR RADAR IS BLOCKED DUE TO ACCUMULATION OF DIRT, ICE, OR SNOW IN "FIELD OF VIEW" - VEHICLE WILL DISPLAY BLOCKAGE MESSAGE IN CLUSTER. ONCE BLOCKAGE IS REMOVED, BLOCKAGE MESSAGE WILL STOP BEING DISPLAYED.
- SNOW PLOW EQUIPPED VEHICLES WILL HAVE A FEATURE IN CLUSTER TO TURN OFF ADAS.

INSTALLED EQUIPMENT SHOULD NOT INFRINGE ON THE RADAR AND CAMERA VIEW ZONES. THE FOLLOWING 3D CAD FILES ARE AVAILABLE BY REQUEST AT FORDBBAS.COM

E-SERIES
ADAS FIELD OF VIEW



LOCATION OF RADAR AND CAMERA ON THE E-SERIES ARE FIXED.
PACKAGE INFORMATION IS FOR GENERAL REFERENCE.
RADAR SHOULD NOT BE MOVED OR ADJUSTED FROM "AS BUILT" LOCATION AND ALIGNMENT.
RADAR COVER CANNOT BE PAINTED OR REPLACED WITH AFTERMARKET COMPONENT.

Body Builders Layout Book

E-SERIES

2021
MODEL YEAR

CHANGE CONTROL INDEX

LTRS	REVISIONS		
ORIGINATOR	CHECKER	ENGR APP	MATL APP
			INITIAL RELEASE
CHMC24-000000-BBLB-AA-01-FNA-ECN/1			
RELEASED			20191024
KVINOTH4	RWAGNE43	SLAZARZ	--
REVISED : SHEET 04			
CHMC24-000000-BBLB-AA-01-FNA-ECN/2			
PUBLISHED			20200207
KVINOTH4	RWAGNE43	SLAZARZ	--
REVISED : SHEET 29-38,40-43			
CHMC24-000000-BBLB-AA-01-FNA-ECN/3			
PUBLISHED			20200309
KVINOTH4	RWAGNE43	SLAZARZ	--
REMOVED : SHEET 39			
REVISED : SHEET 43 - 48			
CHMC24-000000-BBLB-AA-01-FNA-ECN/4			
PUBLISHED			20200608
KVINOTH4	RWAGNE43	SLAZARZ	--